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BROTHER JOSEPH W.  
**STANDER**  
SYMPOSIUM  
4/18/2018

## Letter from the Co-Chairs

We are delighted to officially welcome you to the annual Brother Joseph W. Stander Symposium. The Stander Symposium showcases individual and collaborative undergraduate and graduate research, creative endeavors, and academic achievements. Above all, the Symposium and your participation showcase our shared values as members of the University of Dayton community. This is the 29th year of the Symposium, honoring the late Bro. Joseph W. Stander, S.M. Professor of Mathematics and Provost (1974–1989).

This University-wide celebration of academic excellence exemplifies the Marianist tradition of learning in community. The Symposium includes poster sessions, hands-on activities, performances, art exhibits, oral presentations and highlights of capstone course work. The achievements and collaborations on display throughout the Stander Symposium reflect the continuing commitment of students and faculty to this great tradition.

The Stander Symposium would not exist without an extraordinary effort from across the campus community – students, faculty and staff. On behalf of the Stander Symposium program committee, we thank you for your support and participation.

### **Rachel Collopy, Ph.D.**

Co-Chair, Stander Symposium  
Associate Professor,  
*School of Education and Health  
Sciences: Teacher Education*

### **Joel Whitaker**

Co-Chair, Stander Symposium  
Professor,  
*College of Arts and Sciences:  
Art and Design*



**Brother Joseph W.  
Stander, S.M.**

Professor of Mathematics  
Provost (1974–1989)

Honoring the late Brother Joseph W. Stander, S.M., Professor of Mathematics and Provost (1974-1989), the Stander Symposium celebrates academic excellence, rich collaborations and many forms of intellectual, artistic, and spiritual growth. The career of Brother Joe embodied the spirit of collaboration and the Stander Symposium stands as a continuing tribute to him and all who carry on the Marianist tradition of education through community.

A distinctive spirit permeates student research at the University of Dayton. The faculty and students of the University are determined that “a community of learners” is not a cliché but a realistic goal. Thus the University fosters an atmosphere that nurtures productive collaboration and a shared search for excellence in learning and in research. The Stander Symposium is a day-and-a-half long event, and constitutes the University of Dayton’s principal annual celebration of academic excellence. The Symposium features a keynote speaker, poster sessions, hands-on activities, performances, exhibits, oral presentations and highlights of capstone course work.

All students at the university engaging in research, creative endeavors, and other forms of innovative thinking are encouraged to participate in this student research symposium. Student attendees are key members of a critically reflective audience for their peers. Faculty members serve as mentors and leaders for many of these projects and are the driving force behind scholarship in their fields. The efforts of students, faculty, and staff are critical to making this event successful year after year.

The Brother Joseph W. Stander Symposium Program Committee thanks the students, faculty, and staff for their many contributions and university-wide collaboration in the planning of this year's symposium. With over 1,700 presenters, performers, artists, and faculty mentors participating, the Stander Symposium is a lasting tribute to Brother Joseph Stander and to the Marianist principles of higher education.

For generous support, we specifically owe gratitude to the Office of the President, the Office of the Provost, the Offices of the Deans in the College of Arts and Sciences, School of Business Administration, School of Education and Health Sciences, School of Engineering, Graduate Academic Affairs, and University Libraries. We extend this gratitude to the Ryan C. Harris Learning Teaching Center, the University Honors Program, Student Development, and the Student Government Association.

In addition to the units represented by the Program Committee membership, the Committee specially acknowledges the essential and considerable planning and staff assistance received from Kennedy Union, Roesch Library, Department of Recreational Sports, Marianist Hall Learning Space, KU Box Office, Department of Art and Design, Keck Lab, and University of Dayton Information Technology (UDit).

Finally, very special thanks are due to students Caitlin Schneider and Payton Oakes for their efforts in developing and creating this year's visual design.

### **Co-Chairs**

Rachel Collopy, School of Education and Health Sciences, Teacher Education  
Joel Whitaker, Arts and Sciences, Art and Design

### **Program Committee**

Mateo Chavez, Undergraduate Student, School of Business Administration  
Shannon Driskell, Arts and Sciences, Mathematics  
Diane Helmick, Graduate Academic Affairs  
Janet Herrelko, School of Education and Health Sciences  
Judith Huacuja, Arts and Sciences, Art and Design  
Brian LaDuca, Institute for Applied Creativity for Transformation at ArtStreet  
Amy Lopez-Matthews, Center for Student Involvement  
Margie Pinnell, School of Engineering  
Stephanie Shreffler, University Libraries  
Amit Singh, Arts and Sciences, Biology  
Randy Sparks, School of Business Administration

### **Celebration of the Arts Committee**

Sharon Davis Gratto, Chair, Department of Music  
Michelle Hayford, Director, Theatre Program  
Judith Huacuja, Chair, Department of Visual Arts  
Julia Randel, Chair, Department of Music

### **Graphic Design**

Caitlin Schneider, Graphic Design, Department of Art and Design '18

### **Celebration of the Arts Project Coordinator**

Michelle Jannazo

### **Celebration of the Arts Stage Manager**

Milena Treer

### **Stander Symposium Coordinator**

Andrea Meyer Wade

## **Apr 4 | CELEBRATION OF THE ARTS Schuster Performing Arts Center**

6:30 P.M. | Art Exhibits in the Wintergarden

8:00 P.M. | Performance in the Mead Theatre

Join us as we celebrate the role of the arts in higher education and culture, by sharing our students' best artistic work with the Dayton community.

The evening begins with collaborative and individual student artwork on display in the Schuster Wintergarden. While viewing the exhibits, audience members are invited to enjoy complimentary refreshments and a cash bar—and watch for pop-up performances by theatre and dance students out to prove all the world's a stage! At 8 p.m., the University of Dayton's student performing arts groups in music, dance and theatre take the Schuster Center stage for a diverse and inspiring program. The Celebration culminates with all participants performing the Kyrie from guest composer Glenn McClure's Caribbean Mass, for voices and percussion.

This year's Celebration of the Arts coincides with the 50th anniversary of the assassination of Dr. Martin Luther King, Jr. We seek to honor Dr. King's legacy through artistic creation and collaboration that speak to his dream that we may one day "transform the jangling discords of our nation into a beautiful symphony of brotherhood."

Tickets are free but required. Tickets for UD students, faculty and staff are available at the Kennedy Union Box Office with a valid University ID. Tickets for the general public are available by calling Ticket Center Stage at 937-228-3630 or online at [ticketcenterstage.com](http://ticketcenterstage.com).

## Apr 17 | Stander Keynote Address by Megan Smith

7 p.m. | Kennedy Union Ballroom

*Co-sponsored by the University of Dayton Speaker Series and the Graul Chair in Arts and Languages*

Megan Smith is an award-winning tech entrepreneur, engineer, and evangelist. As the third U.S. chief technology officer, she helped the President harness the power of technology, data, and innovation to advance the future of our nation and the world. Smith recruited top tech talent to serve across government and to collaborate on the most pressing issues of the day, from data science and open source, to inclusive economic growth and criminal justice reform. She focused on broad capacity building by co-creating all-hands-on-deck initiatives, including the public-private program TechHire, the Computer Science for All initiative, and the Image of STEM campaign.

Prior to her role as U.S. CTO, Smith served as vice president of new business development at Google, managing early-stage partnerships across the company's global engineering and product teams. She led acquisitions of Google Earth, Maps, and Picasa, steered the shift of Google.org to include more direct engineering impact, such as Google Crisis Response, and later served on the leadership team of GoogleX, where she co-created SolveForX and Women Techmakers.

As CEO of PlanetOut, Smith was a leader of the online LGBT community in the early days of the Internet. She also worked as an engineer at General Magic on teams designing early smartphone technologies and at Apple Japan in Tokyo. Today, she is CEO of shift7 and serves on the boards of MIT, the MIT Media Lab, and Vital Voices.

All events are free and open to the public. No tickets required. Parking is available in B and C lots only. Parking in any other lot requires a permit.



## **Apr 18 | DAY AT THE STANDER: A Day of Student Research, Creativity and Discovery.**

8 A.M.–5 P.M. | UD Campus Locations

*Full schedule download at [stander.udayton.edu](http://stander.udayton.edu) or on mobile devices via Guidebook or Issuu*

Stander Symposium is the University of Dayton's annual showcase of individual and collaborative undergraduate and graduate research, creative endeavors, and academic achievements. Honoring the late Bro. Joseph W. Stander, S.M., Professor of Mathematics and Provost (1974–1989), the Stander Symposium stands as an ongoing tribute to him and all who carry on the Marianist tradition of education through community.

It is a day off from regularly scheduled courses and meetings; instead inviting the whole University to engage in conversation and learning outside of the classroom.

### **Free Breakfast**

8–9:30 A.M. | RecPlex Main Gym

### **Poster Sessions**

RecPlex Main Gym

Session 1 | 9 to 10:15 A.M.

Session 2 | 3 to 4:15 P.M.

Poster check-in, badge pickup, and poster session information in RecPlex Main Gym 8 A.M. to 10:15 A.M. and 2:15 P.M. to 4:15 P.M.

### **Porch projects, oral presentations, panel discussions, performances, and visual arts displays**

9:00 A.M.–5 P.M. | Various Campus Venues

*Presenter check-in, badge pickup, and central location for Stander Symposium information in Humanities Plaza 9:30 A.M. to 3 P.M.*



### **Stander Symposium Closing Reception & Annual Horvath Awards presentation**

5–7 P.M. | Gallery 249, Fitz Hall

Awards presentation at 5:30 P.M.

Student work is exhibited each spring in the Annual Horvath Juried Student Exhibition. Submission is open to all University of Dayton students taking classes in the Department of Art and Design during the academic year of the exhibition. Since 1975, this event has displayed award-winning works that include sculpture, paintings, drawings, ceramics, prints, photographs and designs.

### **Facing Dayton: Neighborhood Narratives Celebration and Reception**

5–7:30 p.m. | Fitz Hall, Second Floor

Remarks begin at 6 P.M.

*THE FACING PROJECT* is a community storytelling project that intends to bring awareness about human rights issues and assets of a community to inspire social action” ([facingproject.com](http://facingproject.com)). The Dayton stories illustrate the outcomes of our shared humanity, the desire to build community with one another, and to share stories of neighborhoods to inspire continued work for justice. JOIN US in celebrating the stories of Dayton community members and the visualization of these stories following the Department of Art and Design Horvath Awards on the evening of the Brother Joseph W. Stander Symposium



**COLLEGE OF ARTS & SCIENCES**

organized by department/start time

## Creating Inclusive Community: Examining Privilege and Taking Action

College of Arts and Sciences

Panel Discussion - Course Project, 201810 UDI 380 M1

**PRESENTERS** Brett A Bartlett, Darius Jamal Beckham, Leah Ashton Bell, T.J. John Belsterling, Laura Gabriela Benitez, Dezanee M Bluthenthal, R Darden Bradshaw, McKenna Elizabeth Czekajlo, Andrew Stephen Durkin, Russell Thomas Kientz Elting, Lakesha M Fountain, Brianna Gavin, Veronica Renee Halfacre, Claudia E Jackert, Ambria K Jones, Paul Philip Kramer, Jenna Renee Lakes, Shadayah Kabre Lawrence, Thomas L Morgan, Caroline Rose Nevius, Alure M Powell-Russell, Majd Shisha, Cierra Lynn Waller

**ADVISORS** Amy E Anderson, Daria Y Graham, Thomas L Morgan

**LOCATION, TIME** Kennedy Union East Ballroom, 10:30-11:30

This presentation will explore the historical and social implications of diversity and privilege, discussing participants' experiences in examining their own privilege while dialoguing with others about diversity and social justice. Additionally, participants will reflect upon their experiences attending the White Privilege Conference as well as their plans for designing sustainable actions to dismantle injustice in the UD community and beyond.

## Facing Dayton: Visualizing Neighborhood Narratives

College of Arts and Sciences: Art and Design

Oral Presentation - Course Project, 201780 VAD 412 01

**PRESENTERS** Lucy Elizabeth Bratton, Josie Marie Libecap, Nyla C Sauter, Caitlin Joanne Schneider

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** Marianist Hall Learning Space 218, 10:30-10:50

The Facing Project is a nonprofit that connects people through stories to strengthen communities. It is a community story-telling project that intends to bring awareness about human rights issues and assets of a community to inspire social action. Students will present work created in connection with the Fitz Center's Facing Project that were then exhibited at the Human Rights Center's biennial conference, The Social Practice of Human Rights 2017. For the exhibit, senior graphic design students were paired with a community member's story that captures the experience of living in Dayton and the challenges or advantages that go along with it. Following several preparatory activities, students met one-on-one with their storyteller, an experience that furthered their connection to community and inspired them to create impactful book designs intended to bring poetic justice to their subjects and life to their stories. Through awareness outlets such as "Facing Dayton: Visualizing Neighborhood Narratives" communities can come together to discover new solutions to the problems of intolerance and indifference.

## You and Me and Everyone Else: Photography Senior Capstone Projects

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** Sara Elizabeth Frederick, Sylvia Marie Stahl, Brooke Beckman Tinsman

**ADVISORS** Glenna Marie Jennings

**LOCATION, TIME** Marianist Hall Learning Space Commons, 10:30-11:30

Join us for "You and Me and Everyone Else," a presentation of Senior Capstone photography projects by three emerging artists and photographers. Living with Type I Diabetes, exploring the world of Color Guard performance and navigating the myths and realities of Midwest American culture are among the topics taken on within the students' research. Sara Frederick, Sylvia Stahl and Brooke Tinsman will discuss their individual works and offer insight into the world of contemporary image-making.

## Infographics inspired by Paul Laurence Dunbar

College of Arts and Sciences: Art and Design

Oral Presentation - Course Project, 201810 VAD 415 01

**PRESENTERS** Brian Gallagher O'Malley, Hadley Caitlin Rodebeck, Isabella Pearl Vonachen, Olivia Derose Wendt, Ben D Woodruff

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** Marianist Hall Learning Space 218, 11:00-11:20

Students will address the graphic significance and creative thinking process of information design, exemplifying how a well-designed infographic can inform, express, clarify and/or transform complex information into a clear concise visual. The content of each infographic was inspired by the life of African-American writer Paul Laurence Dunbar. Students explored a variety of approaches using information gathered from a tour of Dunbar's grave in Woodland Cemetery, attending a Graul Chair Recital celebrating Dunbar's work, and taking a tour of his historic homestead. Through extensive research and data collection, students discovered fascinating connections between Dunbar and his contemporaries that lead to each one creating his or her own unique information design panel inspired by the life and work of Dayton native Paul Laurence Dunbar.

## The Facing Dayton Project: Swim-to-Row Poster

College of Arts and Sciences: Art and Design

Visual Arts Exhibition - Course Project, 201780 VAD 345 02

**PRESENTERS** Jeremy N Rosen**ADVISORS** Misty K Thomas-Trout**LOCATION, TIME** Marianist Hall Learning Space 218, 11:30-11:50

The Facing Project is a community story-telling project that intends to bring awareness about human rights issues and assets of a community to inspire social action ([facingproject.com](http://facingproject.com)). I participated in it while a student in Typography Two under Prof. Thomas-Trout. Typography Two deals with the ideas of the poetic, practical and persuasive nature of typography that encourages designers to investigate content from these varying perspectives. We were assigned personal narratives from individuals in the Dayton area, which we then analyzed to uncover inherent and potential meanings that could be translated visually as expressive, typographical posters. The process revealed ways to integrate the poetic, practical and persuasive ideas within the individual posters; typographically, these posters display poetic in the way it conveys the messages within these stories; practical in the sense that it disburses the information; and persuasive in how it teaches the history of the Dayton communities while raising awareness on current social justice issues. In turn, our work functioned as "visual narratives" for stories about the unique experiences of community locals. Professor Thomas-Trout received the Experiential Learning Innovation Grant in the Fall of 2017 that helped fund an exhibition at the Dayton Metro Library. Students successfully developed this poster exhibition through these five teams: install, deinstall, curatorial, promotional, reception/food and beverage. I worked as head of the curatorial group throughout the process, strategizing with my peers on how to utilize spatial components to our advantage and on the placement of posters so as to invite viewers through the room. This community-based graphic design exhibition, "Facing Dayton: Visualizing Neighborhood Narratives" celebrated community and fellowship through the visual language and promoted the benefit of experiential learning.

## **A presentation of the Senior Visual Arts Capstone Projects**

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** Intisar Alrasheed, Emily Kelly Griffin, Veronica Renee Halfacre, Alison Marie Hiatt, Allison Teresa Perry, Jesse James Thompson, Melanie Christine Zebrowski**ADVISORS** Tim A Wilbers**LOCATION, TIME** Marianist Hall Learning Space Commons, 11:40-1:00

Visual Arts majors in the Department of Art and Design will present research and analysis of their individual journey culminating in creative self-directed artistic projects. Each student project is unique and reflects their selected vocations in the visual arts determined by a review of professional practices, standards and activities across related disciplines.

## **Department of Art and Design, Advanced Photography Student Presentations**

College of Arts and Sciences: Art and Design

Porch Project - Course Project, 201810 VAP 410 01

**PRESENTERS** Annie Ellis Denten, Maura M Parker**ADVISORS** Joel A Whitaker**LOCATION, TIME** 461 Keifaber Street, 12:30-12:45

Students from the Department of Art and Design, Advanced Photography (a seminar course that examines the aesthetic, cultural, ethical, and pragmatic issues relating to photographic practice), will give presentations on their respective semester long independent photographic research projects.

## **Fine arts thesis presentations**

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** Marie E Cossins, Mary Elda Rose Cregan, Olivia Nicole Garzona, Mariamelia Miranda, Taylor Christine Orr, Meghan E Sismour**ADVISORS** Jeffrey C Jones**LOCATION, TIME** Marianist Hall Learning Space Commons, 1:10-2:10

Presentations of fine arts senior research.

## **With Him**

College of Arts and Sciences: Art and Design

Stander Undergraduate Fellowship Awardee

Porch Project - Independent Research

**PRESENTERS** Jesse James Thompson**ADVISORS** Jeffrey C Jones**LOCATION, TIME** 514 Lowes Street, 1:45-2:00

For the Stander Undergraduate Fellowship I will be showing an exhibition at 514 Lowes that entails a variety of media. With multi-media pieces, purely photographic pieces, some alternative, and some painting I am showing a series of works that represent my

understanding of sexuality and growth in relationships. The pieces speak to social platforms and sexuality behavior beyond heteronormative culture.

## #Aware

College of Arts and Sciences: Art and Design

Stander Undergraduate Fellowship Awardee

Porch Project - Independent Research

**PRESENTERS** Hadley Caitlin Rodebeck

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** 461 Keifaber Street, 2:15-2:30

#Aware is a presentation created to address today's contradicting views of feminism and demonstrate how blaming 'the patriarchy' is not the answer. A video/installation will be shown followed by discussion concerning the critique of what is lacking in the discussion of female empowerment such as personal responsibility, self-defense, that it is not a gender-specific issue, and how to heal from a traumatic situation is as important as how to prevent a trauma-based situation.

## Understanding Place Branding

College of Arts and Sciences: Art and Design

Porch Project - Honors Thesis

**PRESENTERS** Lucy Elizabeth Bratton

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** 432 Stonemill Road, 2:30-2:45

This Honors Thesis Project explores an emerging area of graphic design known as place branding. Place branding markets the physical, economic, social, and civic qualities of a place to enhance economic and community development. Successful city brands are derived from the histories, qualities, lifestyles, and cultures of their cities to proactively form partnerships between city municipalities, government, and citizens. When created and implemented successfully, place branding has the unique ability to unite and enhance the lives of citizens. By closely examining successful samples of recent place branding, this project presents the creation of a mark and guidelines for the place branding of the city of Dayton, Ohio. This creative research is presented in the design of a physical book.

## Arts-Based Research in Art Education

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** R Darden Bradshaw, Morgan Noel Bukovec, Rose C Defluri, Bridget Anne McCafferty

**ADVISORS** R Darden Bradshaw

**LOCATION, TIME** Marianist Hall Learning Space Commons, 2:30-3:30

Senior Art Education students share their individual investigations into arts-based research. Poised to enter the field of art education and tasked with supporting future students in meaningful art making, these preservice teachers explore the various intersections of art, research, and teaching in a fast-paced, visually engaging manner.

## Facing Dayton: Visualizing Neighborhood Narratives

College of Arts and Sciences: Art and Design

Visual Arts Exhibition - Course Project, 201780 VAD 345 01

**PRESENTERS** Intisar Alrasheed, Laila Abdullah Alshuwaikhat, Emily Katherine Brady, Annie Brinkman, Jessica Rose Burnham, Erin Butrica, Jesse Chapman Alexander Chapman, Merani Yvonne Cosme, Claire Allison Cullen, Kristin Elizabeth Davis, Sarah Marie Fieldhammer, Beth Margaret Fuchs, Emily Carroll Gorenc, Meg Elizabeth Gramza, Emma Quill Kaufman, Caitlin Rebecca Marshall, Payton Maureen Oakes, Alyssa Elaine Ramstetter, Steven George Rojc, Jeremy N Rosen, Caitlin Joanne Schneider, Cassie Carol Smith, Taylor Katherine Wilson, Nan Xiang, Zhuo Xu

**ADVISORS** Misty K Thomas-Trout

**LOCATION, TIME** Fitz Hall Second Floor, 5:00-7:30

The Facing Project is a community story-telling project that intends to bring awareness about human rights issues and assets of a community to inspire social action ([facingproject.com](http://facingproject.com)). Kelly Bohrer and Alexa Irwin with the Fitz Center have begun one of these projects titled "Facing Dayton: Neighborhood Narratives". The Department of Art & Design Typography Two class—taught by Professor Thomas-Trout—collaborated with Kelly and Alexa. The students were to visualize these narratives through the form of a typographic poster. Typography Two deals with the ideas of the poetic, practical and persuasive nature of typography that encourages designers to investigate content from these varying perspectives. Students analyzed the text and its inherent and potential meaning(s) and then generated several visual iterations. The process revealed ways to integrate the poetic, practical and persuasive ideas within the individual posters. Twenty-five students were paired with 25 different stories from several Dayton communities. The student designers successfully communicated these narratives through the interconnectedness of the poetic, practical and persuasive—allowing the type to speak as the voice of the storyteller. Typographically these posters display poetic in the way it conveys the messages within these stories; practical in the sense that it disburses the information; and persuasive in how it teaches

the history of the Dayton communities while raising awareness on current social justice issues. Professor Thomas-Trout received the Experiential Learning Innovation Grant in the Fall of 2017 that helped fund an exhibition at the Dayton Metro Library. Students successfully developed this poster exhibition through these five teams: install, deinstall, curatorial, promotional, reception/food and beverage. This community-based graphic design exhibition, "Facing Dayton: Visualizing Neighborhood Narratives" celebrated community and fellowship through the visual language and promoted the benefit of experiential learning.

### **The Facing Project: Stories of Challenge, Change, and Community | Short Films by Digital Processes II (VAP340) Students**

College of Arts and Sciences: Art and Design

Visual Arts Exhibition - Course Project, 201780 VAP 340 01

**PRESENTERS** Jesse Chapman Alexander Chapman, Annie Ellis Denten, Claudia Grace Ferguson, Sara Elizabeth Frederick, Maura M Parker, Nora Eileen Sullivan

**ADVISORS** Julie R Jones

**LOCATION, TIME** Fitz Hall Second Floor, 5:00-7:30

A collaboration between students from The Department of Art & Design, Digital Processes II (VAP 340) course and selected "The Facing Project" storytellers, narratives, and communities. Each student produced a 3-5 minute short film on highlighted Dayton neighborhoods from "The Facing Project," exploring the changes and challenges that each community faces; several students reached out to and collaborated with community members, whose mission is to raise awareness towards and the enrichment of these places they call home. Short films range from traditional documentary investigation to visually poetic interpretations of the narratives and landscape that define each neighborhood. Featured Dayton neighborhoods include: Carillon, Dayton View Triangle, Edgemont, McCook Field, McFarlane, and Westwood. Special thanks to the residents, businesses, and other partners that contributed to this project, including: Dakota Center, Dayton Kroc Center, Marco and Leona Marmolejo, Jonique McNeal, Sharon Mitchell, Omega Baptist Church, Jackie Patterson, Mary Varnado, and the Fitz Center for Leadership in Community.

### **Revealing when, how, and how often a pigmentation gene network evolved to be sexually dimorphic in a fruit fly subgenus**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Abbey Marie Groszkiewicz, Jesse Taylor Hughes

**ADVISORS** Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Since the origin of the 36 recognized animal phyla, evolution can be largely summarized as the diversification of characteristics among these original body plans. As animal characteristics are the products of development, a key challenge for contemporary research is to reveal the ways in which development evolves through changes in the use of genes within a gene regulatory network. One ideal trait for deep mechanistic study is the coloration patterns observed on the abdominal tergites of fruit fly species from the *Sophophora* subgenus. Prior research has supported a scenario where elaborate melanic pigmentation limited to the male abdomen evolved once within this clade through the evolution of a sexually dimorphic pattern of expression for the *bric-à-brac* transcription factor genes. My research seeks to confirm or revise this scenario by bringing attention to the distribution of species with elaborate male pigmentation among the diverse *Sophophora* species groups and interrogating the patterns of *bric-à-brac* expression during the development and coloration of abdominal tergites.

### **Using RNA-interference to Identify the Genetic Toolkit for a Fruit Fly Morphological Trait**

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Abbey Marie Groszkiewicz, Jesse Taylor Hughes

**ADVISORS** Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Metazoan animal morphological traits result from the combined inputs of hundreds or more genes that comprise gene regulatory networks (GRNs). Each GRN utilizes various genes from the genetic toolkit of transcription factor and signaling pathway genes to control complex patterns of gene expression. However, for few traits, if any, has the full repertoire of toolkit genes been characterized for its GRN. Thus, how traits are built by regulated gene expression remains poorly understood. For my thesis, I am investigating the genetic toolkit that makes a male-specific pigmentation for the fruit fly species *Drosophila melanogaster*. Using RNA-interference, I will reduce the expression of ~190 transcription factor and ~21 signaling pathway genes to find those necessary for this trait by surveying for deviant pigmentation phenotypes. The results will provide a greater understanding of how a GRN is able to direct the formation of a well formed trait.

### **Molecular Modeling of Organic Matrix Proteins in Oysters**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Anna Kathleen Benton

**ADVISORS** Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Three organic matrix proteins, Pearlin, Prismalin, and Shematrin, from the shell of the oyster *Pinctada fucata* have been isolated, characterized, and the sequences reported in the literature. These organic matrix proteins are known to interact with one another and with the mineral layers in assembly of the shell, but how the interaction occurs is unknown. This project focuses on molecular modeling of the proteins to discover how this interaction occurs by using the 3D modeling program Chem3D® (PerkinElmer). The molecular modeling program initially displays each protein in the least sterically-hindered conformation. Next, post-translational modifications were made to model the amino acid crosslinking that must occur between the proteins; the introduced post-translational modification is addition of a hydroxyl group to Tyrosine residues to form L-3,4-dihydroxyphenylalanine (L-Dopa) residues. The modifications of changing the tyrosines to L-Dopa were made to the protein sequence at random to identify any combination of alterations that would be most beneficial for the interaction between the organic matrix proteins and the mineral. After an acceptable conformation was found, the protein was replicated in the modeling program. The proteins were then rearranged to determine the most favorable electrostatic arrangement, one with polar regions of the protein interacting with one another. This modeling approach will be used in the future for proteins isolated and characterized from our experimental organism, *Crassostrea virginica*, the eastern oyster.

## Determining the Role of Membrane Fatty Acid Composition in Antibiotic Resistance

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Andrew J Deak

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Bacterial infections that can no longer be treated by antibiotics because of bacterial mutations cause many infections and deaths each year. My research conducted aims to study how membrane fatty acid composition can affect bacterial susceptibility to antibiotics. *Listeria monocytogenes*, a gram-positive facultative anaerobe, is the bacterium that I am testing. *Listeria* has 80-90% branched-chain fatty acids (BCFAs) which allow membrane fluidity and sufficient protection against invaders. When *Listeria* is grown in the presence of butyrate, the BCFAs become straight-chain fatty acids (SCFAs) and make the once fluid membrane more rigid. We believe that this allows for easier antibiotic penetration of the phospholipid bilayer which lets the antibiotics affect cellular processes. By changing concentrations of butyrate I can therefore determine the minimum inhibitory concentrations of antibiotics for *Listeria* with different membrane fatty acid compositions. Moreover, as growth is a key factor in bacterial susceptibility to antibiotics. I also measure oxygen consumption rate in response to butyrate. Higher oxygen consumption rate is indicative of higher bacterial activity. Because oxygen consumption is carried out by protein complexes on the membrane, measuring oxygen consumption rate also reveal the effects of butyrate on cell membrane functionality.

## Characterization of the Glycosylation of Aquaglyceroporin HC-3 in Erythrocytes from the Freeze Tolerant Anuran, *Dryophytes chrysoscelis*

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Dante Laurenti Pezzutti

**ADDITIONAL AUTHORS** James Frisbie, David Goldstein (Wright State University)

**ADVISORS** Carissa M Krane

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Cope's gray treefrog, *Dryophytes chrysoscelis*, is a freeze-tolerant anuran that uses glycerol as a cryoprotectant. In erythrocytes of *D. chrysoscelis*, transmembrane glycerol flux is likely facilitated through the aquaglyceroporin, HC-3. Previous research demonstrated that erythrocytes from cold-acclimated treefrogs up-regulate HC-3 protein expression, membrane localization, and glycosylation. Thus, we hypothesize that anticipatory glycerol accumulation observed in cold-acclimated treefrogs contributes to enhanced post-translational modification of HC-3 via N-linked and O-linked glycosylation, and that HC-3 glycosylation is important in subcellular trafficking of HC-3 to the membrane. Densitometric analyses of immunoblots specific for HC-3 showed a 3.5-fold and 1.9-fold average increase in glycosylated HC-3 from RBCs cultured with the addition of glycerol (CCCM+G) as compared to Freshly Isolated RBCs (FI) and RBCs cultured in CCCM alone, respectively. Western blots of RBC proteins treated with PNGase F resulted in a 1.3-fold average decrease in glycosylated HC-3 compared to control proteins. However, protein treatment with O-Glycosidase and Neuraminidase did not change the abundance of glycosylated HC-3. Additional results were collected using scanning laser confocal microscopy and HC-3 localization was measured in mean fluorescent intensity (arbitrary units) using ImageJ software (N=4-6 cells per experiment). For RBCs cultured in CCCM+G, immunofluorescence intensity of HC-3 in the plasma membrane was 21.7 times greater than HC-3 immunofluorescence in the cytosol ( $P < 0.05$ ). In contrast, immunofluorescence intensity of HC-3 in the cytosol was 3.2 times greater than HC-3 immunofluorescence in the membrane for FI RBCs ( $P < 0.01$ ). Through the use of an in vitro cell culture system, we have recapitulated cold-acclimated in vivo HC-3 expression patterns through the addition of a glycerol-induced hyperosmotic environment to warm-acclimated erythrocyte cell cultures of *D. chrysoscelis*. Thus, in addition to its osmoregulatory role, glycerol may also influence the N-linked glycosylation and membrane trafficking of HC-3.

## Resolving the Molecular Mechanisms by Which DNA Mutations Alter the Function of a Genetic Switch

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Emily Elisabeth Wey

**ADVISORS** Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Each human genome possesses around a million mutations that are genetic baggage from DNA replication mistakes or “mutations” that occurred in the past. Each mutation can have one of three outcomes on an individual, these are to improve, reduce, or have no effect on health. Moreover, the effects of such mutations can depend on the presence or absence of other mutations, so called epistatic interactions. A major goal of genomic medicine is to glean diagnostic or predictive health information from the genome sequences of individuals. However, this goal remains out of reach as the effects of mutations and epistatic interactions are difficult to predict without knowing the function of the DNA sequence they reside in. This difficulty is especially heightened for mutations occurring in cis-regulatory element sequences that act as switches to control gene transcription. The research I plan to perform for my Honors Thesis is to use a fruit fly model to test hypotheses about the molecular mechanisms by which mutations alter a genetic switch's activity and whether these mutations are subjected to the tyranny of epistatic interactions. I will study the *Drosophila melanogaster* dimorphic element which is a transcription-regulating switch for the *bric-à-brac* genes. Three mutations in the dimorphic element were identified that individually alter the level of *bric-à-brac* transcription. The presence or absence of epistatic interactions will be determined by measuring the activity of dimorphic elements from related species that have been engineered to possess the *Drosophila melanogaster* mutations. I will also test the hypothesis that these mutations impart their effects by creating or destroying binding sites for proteins known as transcription factors. The results will provide a sorely needed example where an understanding of molecular mechanisms bridges the gap between a DNA sequence and its *in vivo* function.

## *Drosophila* Eye Model to Investigate How Mutations in *OPA1* and *Drp-1* Genes Contribute to Neurodegeneration in Alzheimer's Disease

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Elizabeth Ann Borchers, Neha Gogia, Lydia Christine Payton, Ankita Sarkar

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's Disease (AD) is a progressive neurodegenerative disorder with no known cure to-date. This disease is caused by the extra-cellular accumulation of amyloid-beta 42 (A $\beta$ 42) peptides, which ultimately leads to results in neuronal cell death. In our study, we have used *Drosophila melanogaster* (a.k.a fruit fly) as our model organism (as its genome is highly conserved with humans and any insights generated here can be extrapolated to humans), and have developed transgenic fly model of AD where human A $\beta$ 42 peptides can be misexpressed specifically in differentiating photoreceptor neurons using GAL4/UAS system, without affecting the reproductive ability and life span of flies. One of the hallmarks of AD is generation of Reactive Oxygen Species (ROS) which triggers neuronal cell death. We have found that (1) there is a strong correlation between increased ROS levels and mitochondrial fragmentation and increased levels of ROS and that (2) a fine balance between both mitochondrial fusion, fission events is essential for normal mitochondrial/cellular functions. Any perturbations, in these process results in increased ROS levels which triggers neuronal death. In our study, we have found two dynamin related GTPases (1) *opa1* and (2) *drp1*, which can regulate mitochondrial fusion and fission events respectively. Mutations in *opa1* (an early stop signal), produces small unstable mitochondrial proteins, and increases ROS levels in neurons. Thus, we hypothesize that *opa1* and *drp1* are involved in regulating A $\beta$ 42 mediated neurodegeneration. To test our hypothesis, we misexpressed *opa1* and *drp1* in A $\beta$ 42 background (using GAL4/UAS system) and checked for resultant phenotypes in the eye. Our results showed that (1) up-regulating and downregulating *opa1* rescues A $\beta$ 42 mediated neurodegeneration only in female flies and in male flies eyes respectively, (2) down-regulating *drp1* rescues A $\beta$ 42 mediated neurodegeneration only in female flies, while (3) up-regulating *drp1* did not result in any eye rescues phenotypes. This study has significant bearings on mitochondria's role in neurodegeneration. Keywords: Alzheimer's Disease, Neurodegeneration, Reactive Oxygen Species, Mitochondrial fragmentation

## Unravelling novel calcium-signaling mechanisms implicated in the neurobiology of learning and memory

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Aikaterini Britzolaki, Joey Edward Saurine

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Calcium ions are potent regulators of cell fate, as they carry essential information from egg fertilization to cell death. Neuronal cells are no exception to this; calcium signals are critical for neuronal cell function and survival. Intrinsic calcium-cycling aberrations have a detrimental effect on neuronal cell fate, long-term potentiation, learning and memory. Subsequently, calcium signaling imbalances



are associated with a wide range of debilitating neuropsychiatric disorders whose pathophysiological mechanisms are elusive. Our group focuses on unravelling the regulatory mechanisms coupled to calcium handling in the central nervous system. Comprehensive studies have revealed that distribution of calcium in the cell is majorly regulated by the endoplasmic reticulum (ER), and hence the latter's critical role in maintaining neuronal calcium homeostasis. We have recently identified a novel calcium-regulating protein expressed in the brain and we demonstrate for the first time, its implication in regulating learning and memory processes in the mouse brain. In the context of this presentation we will demonstrate overwhelming molecular and behavioral data to support the pivotal role of this novel calcium-regulating protein in the neurobiology of learning and memory.

## The Role of FNR/CRP Regulators in Listeria Aerobic and Anaerobic Production of Listeriolysin O

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Lexi Diane Brezovec

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Listeria is a dangerous human pathogen transmitted through consumption of contaminated food products. During infections, Listeria is exposed to the anaerobic intestinal lumen. However, the mechanisms modulating how Listeria responds to the anaerobic environment are not fully understood. I completed experiments to help understand the role of the FNR/CRP family of transcription factors in Listeria and their response to anaerobic conditions. I did this by comparing wildtype Listeria and mutants deficient in FNR/CRP transcription factors in their ability to produce the toxin, listeriolysin O. If a specific transcription factor is involved, the mutant deficient in that factor would exhibit a different phenotype from the wildtype bacteria. After testing 3 out of the 13 mutants, I found that each mutant, similarly to the WT, produced more listeriolysin O under anaerobic conditions than aerobic conditions. My preliminary results confirm that Listeria can regulate listeriolysin O production in response to anaerobic conditions. I will continue my investigations in the future on the remaining 10 mutants, testing the different responses in aerobic and anaerobic conditions.

## Modulation of Listeria monocytogenes carbon metabolism by short chain fatty acids

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Diksha Bedi

**ADVISORS** Jeremy M Erb, Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Listeria monocytogenes, a bacterial pathogen, is associated with foodborne infections in humans. Listeria encounters short chain fatty acids (SCFAs) during its transit through the intestine but its metabolic responses to SCFAs are not fully understood. To determine how Listeria metabolism is affected by SCFAs, I performed basic microbiology assays, including monitoring optical density, determining acetoin production, and measuring culture pH levels, to assess Listeria growth in the presence of butyrate, propionate, and acetate. I also performed preliminary <sup>13</sup>C-NMR assays to provide a more in-depth look into carbon metabolism in SCFA-treated Listeria. I found that propionate-supplemented, but not glucose-supplemented, Listeria produced significantly more acetoin compared to no supplemented controls. Because acetoin is a product of central carbon metabolism, my result suggests that Listeria is capable of changing its carbon metabolism in response to propionate. My preliminary <sup>13</sup>C-NMR results have not revealed how carbon metabolism is altered by propionate and are under current investigation. Further investigation will provide more knowledge in the metabolic mechanism associated with Listeria responses to SCFAs during intestinal transit.

## The medial prefrontal cortex is a sex-specific mediator of ketamine's antidepressant action

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Emily Margaret Flaherty, Joey Edward Saurine, Connor F Thelen

**ADDITIONAL AUTHORS** Jonathon Sens, Sara Mohamed

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Diagnosis of Major Depressive Disorder (MDD) has steadily been increasing in recent years and by 2030 this neuropsychiatric disease is projected to be the leading cause of disease burden world-wide. While MDD is more prevalent than ever before, new treatment options are being explored to provide rapid and long-lasting relief. One of the most promising candidates is the non-competitive N-methyl-D-aspartate receptor antagonist ketamine. This drug, in low doses, has been shown to alleviate symptoms of depression within hours in both animal models and treatment-resistant depressed patients. Despite this revolutionary finding, research focusing on the effects of ketamine has been predominantly conducted in males. What's more, recent studies have identified a sex-specific antidepressant response to ketamine making the need for further investigation imperative to ketamine's future role as an effective treatment option for both males and females. In this study, the role of the medial prefrontal cortex (mPFC) in mediating ketamine's antidepressant response was assessed in stress-naïve male and female C57BL/6J mice. It was discovered that ketamine induced male-specific neuromolecular alterations in the mPFC that may underlie the drug's therapeutic effects; these same alterations in protein expression and synaptic spine density were not present in females. Taken together, the data supports that the

mPFC may be more important in regulating the male antidepressant response to ketamine whereas other brain regions may play a greater role in orchestrating ketamine's beneficial effects in females.

## The impact of soil micronutrients on the gut microbiome of orthopterans

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Melani Katharine Muratore, Caitlin Joanne Schneider

**ADVISORS** Kathleen A Kargl, Chelse M Prather, Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Nutrient limitation and nutrient-related stress can impact animal growth and abundance. An animal's microbiome can also be affected by environmental and population constraints. The aim of our study is to investigate the role of both macronutrients such as nitrogen and phosphorus, and micronutrients, including sodium, calcium, and potassium, in shaping the gut microbiome of grasshoppers and other orthopterans. Grasshopper and katydid species were obtained from a coastal tall grass prairie in Texas, which was part of a multifactorial fertilization experiment manipulating the presence of macronutrients and sodium, calcium and potassium in all possible combinations, and dissected to harvest the gut, from the crop to the hind gut. We then extracted DNA from 75 orthopteran gut samples and submitted the same for high throughput 16s and 18s sequencing with plastid filtration by Zymo Research. The sequencing results indicated a wide range of species diversity both within individuals and between them. Alpha diversity rarefaction calculations confirmed sequencing saturation in all samples. Results show a relative abundance of *Erwinia*, a genus that includes many plant pathogens. Preliminary analysis suggests a relationship specifically between the presence of sodium, coupled with nitrogen and phosphorus and the relative abundance of *Erwinia*, as well as other taxa. There also appear to be microbiome composition differences between species that are strict herbivores and those that are omnivorous. Our results indicate that both macro and micro nutrients affected the composition of the gut microbiome of these orthopterans and highlight the potential role of the orthopterans in the transmission of plant pathogens.

## Changes in Herbaceous Plant Diversity in an Old-Growth Ohio Forest Before and After Emerald Ash Borer Invasion

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Taylor Melissa Buskey

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The herbaceous layer of eastern North American deciduous forests is an important contributor to biodiversity in this region. One of the greatest threats to herbaceous plant diversity is the introduction of invasive species, which can suppress native species and alter local environmental conditions. *Agrilus planipennis* (emerald ash borer) is a non-native insect pest that has caused a mass death of ash trees (*Fraxinus* spp.) in North America since its introduction to the United States. The resultant changes in canopy structure may affect local conditions and thus have indirect impacts on herbaceous layer composition. Drew Woods State Nature Preserve is a 6-ha old-growth forest fragment in Darke County, Ohio that has recently experienced EAB-related ash mortality. Our goal was to understand how herbaceous layer diversity has been changing through time in response to this sitewide canopy disturbance. Annual surveys of herbaceous biodiversity were conducted across 32 1-m<sup>2</sup> sampling plots from 2012 to 2017. Species richness, total cover, Shannon Diversity, and species evenness were calculated for each plot by year, and beta diversity (Bray-Curtis Dissimilarity) was used to assess community turnover through time. Repeated measures ANOVA was used to test for significant changes over this period, and regression analyses were used to understand relationships between diversity and environmental variables (canopy cover, soil moisture, and distance to forest edge). Species richness and herbaceous cover tended to be higher in more recent sampling years. There was a temporally consistent north-south gradient where diversity tended to be greater toward the southern edge of the stand. These results suggest that EAB-induced ash mortality is increasing light availability via canopy gap formation, which is a driving factor of herbaceous diversity. The full impact of EAB is not yet clear, but will likely extend beyond ash mortality and have important indirect effects on other parts of forest ecosystems.

## Possible pharmacologic glioma treatment in *Drosophila* model

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Luke Alan Bressler, Karishma Sanjay Gangwani, Catherine E Martini, Margarita Rosa Mendez, Isha Mishra, Kirti Snigdha, Jordan M Terschluse

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Glioma is a lethal brain cancer, and current treatment strategies have limited effects by extending life only by a few months. Thus, efforts should be made to discover better inhibitors of glioma growth. Ideally such inhibitors will suppress the progression of glioma by (a) inhibiting the underlying molecular pathways activated in glioma, or (b) prevent rapid proliferation of the glia and other cells that encompass the glioma tumor. We have developed a glioma model by co-activating PI3K and Ras/MAPK specifically in the

Drosophila CNS glia. The Drosophila glioma cause the larval brain to appear enlarged due to rapid increase in the stem cells and their glial and neural progeny. These tumors cause the larvae to enter a prolonged larval phase, and eventually kill the organism. We are conducting a chemical screen using Tyrosine kinase inhibitors (Selleck Biochem.) in which we feed early third instar (72h old) larvae 10 or 300uM chemicals in DMSO and then see effects on glioma growth, and survival in mature third instar stage (120h old). Using these metrics, here we present data from our screen on B1-B11 of the library. Once we identify potential glioma inhibitors in the primary screens, we will validate them in secondary screens.

## The role of oxygen in antibiotic resistance in *Listeria monocytogenes* and *Staphylococcus aureus*

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Emilee Kay Zoog

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Antibiotic resistance in bacterial pathogens has been a growing concern in recent years as infections that were once easily treated are becoming bigger threats. In agriculture and healthcare, the importance of antibiotic stewardship has been emphasized in an effort to decrease the overuse of antibiotics. Development of novel antibiotics and improvement in current antibiotic testing protocols are two additional avenues being pursued to solve the issue. In this study, I tested the effects of hypoxia on the antibiotic susceptibility in two human pathogens, *Listeria monocytogenes* and five different strains of *Staphylococcus aureus* (USA 300, Romero, COL, Newman, and SH1000), using a standard disc diffusion assay. However, in addition to the standard aerobic incubation, anaerobic incubation was also performed to understand whether hypoxia affects antibiotic susceptibility in these pathogens. My results showed that susceptibility to rifampin, ciprofloxacin, chloramphenicol, and tetracycline increased in an anaerobic environment while susceptibility to erythromycin and bacitracin decreased in an anaerobic environment. *Listeria* was resistant to streptomycin and penicillin in both environments. Similarly, all five strains of *S. aureus* exhibited changes in antibiotic susceptibility during hypoxia. For example, the methicillin-resistant *S. aureus* strain USA300 became more susceptible to rifampin, ciprofloxacin, and penicillin in an anaerobic environment. These results suggest that oxygen levels play a key role in bacteria susceptibility to antibiotics. Therefore, we need to consider the effectiveness of antibiotics under relevant environmental conditions to help antibiotic usage become more efficient.

## Understanding the Link between Sugar Diet and Alzheimer's Disease using *Drosophila* Eye Model

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Jordan Clay Dubbs, Neha Gogia, Ankita Sarkar, Ian Joseph Tobal

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD), is a progressive neurodegenerative disorder and is the sixth leading cause of death in the United States (US), with no cure to date. It is caused by abnormal cleavage of amyloid precursor proteins (APP), generating amyloid-beta-42 (A $\beta$ 42) plaques that trigger neuronal cell death by unknown mechanism(s). Neuroinflammation (body's response to repair, damage and defend against foreign agents) is another characteristic feature of this disease. According to US Department of Agriculture (2017), an average American consumes 94 g of sugar per day which is equivalent to amount of sugar in 2.4 cans of coke. The impact of this high amount of blood sugar can be very significant as breakdown of glucose in high-sugar diet damages the enzymes that regulate inflammation (in immune responses), resulting in mis-regulated neuroinflammation, strokes, and chemical imbalances, and thus may contribute towards AD. In our study, we want to elucidate the effect of both high and low sugar diet on Alzheimer's. To test our hypothesis, we have used *Drosophila melanogaster* (a.k.a. fruit fly), (as genetic machinery is conserved from flies to humans) and developed a fly model of AD, where human A $\beta$ 42 peptides can be misexpressed in *Drosophila* eye using GAL4/UAS system. We placed flies expressing human A $\beta$ 42 in eyes (along with the controls) on regular, low, and high sugar diet and checked the phenotypes in eye imaginal discs, adult flies and collected final death count. Wingless and a soy protein, Lunasin (anti-inflammatory in nature) were also studied to understand their role in progression of AD. Our study shows, that a high-sugar diet displays a more aggressive progression of AD as compared to a normal diet or a low-sugar diet. This research has significant bearings in understanding the potential link between AD and diabetes, as both are very prominent diseases in today's world.

## The Role of Pyocyanin in the Protection of *Pseudomonas aeruginosa* from Singlet Oxygen

College of Arts and Sciences: Biology

Poster - Course Project, 201810 BIO 421 P1

**PRESENTERS** Celeste Claire Bergman, Edward T Eshoo, Grace Kathryn Goulet, Stacey Marie Lapurga

**ADVISORS** Yasuhiko Irie

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Pseudomonas aeruginosa* is an opportunistic pathogen that causes both acute and chronic infections in immunocompromised individuals. *P. aeruginosa* is resistant to many antibiotics, and there is a critical need for novel antimicrobial strategies that are viable for clinical use. Photodynamic therapy (PDT) is currently undergoing clinical trials. PDT involves chemicals called photosensitizers that

when exposed to light, produce a highly reactive oxygen species  $^1O_2$ . Singlet oxygen can non-specifically cause damage to all cellular structures of rapidly metabolizing organisms such as bacteria, while slower metabolizing host tissues are less affected. Furthermore, light can be restricted to only afflicted areas, thus limiting the damage to healthy tissues.  $^1O_2$  is naturally produced during photosynthesis, and photosynthetic organisms produce pigmented compounds such as Beta-carotene that can absorb  $^1O_2$  before damaging the cells. *P. aeruginosa* produces a blue pigmented compound pyocyanin when they grow in high density. In previous study, pyocyanin was discovered to be capable of binding  $^1O_2$ . In this project, we hypothesize that *P. aeruginosa* pyocyanin can have a protective role against singlet oxygen. The data from this project can provide an important insight to possible resistant mechanisms against a novel antimicrobial therapy still in development. Understanding the resistance against PDT prior to clinical use can have a significant impact towards shaping how PDT is administered in clinical environments, so that resistant strains do not eliminate PDT as an option the way antibiotics have been eliminated by resistant strains.

## Determining what environmental features affect waterbird diversity on the Great Miami River

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Hannah Marie Scharf

**ADVISORS** Jeffrey L Kavanaugh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The habitat of the Great Miami River is highly disturbed as it enters the city of Dayton, yet it still attracts many species of birds. These include Anseriformes, which are waterfowl, Charadriiformes, which contain shorebirds and gulls, Pelecaniformes, which contain herons, Suliformes which contain cormorants, and Podicipediformes, which are the grebes. This study seeks to determine which segments of the Great Miami River attract the most and the least numbers and species of waterbirds during the fall migration, and what environmental characteristics set these segments apart. To accomplish this, we divided a four mile segment of the Great Miami River into tenth of a mile intervals, spanning from the confluence of the Great Miami River with the Mad River downstream to the Tait Station low dam. For each interval we counted and identified every bird, in addition to recording environmental features of interest. After identifying the two best and the two worst intervals, we evaluated the habitat with the Qualitative Habitat Evaluation Index (QHEI) and plan to further investigate these areas with additional analyses. By identifying and characterizing these areas of the Great Miami River, sections of the river can be better managed to encourage greater species diversity and numbers of waterbirds.

## Role of Relish/NFkB Apoptosis Pathway in Amyloid-beta 42 mediated neurodegeneration in Alzheimer's disease

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Steven Gerard Borchers, Neil William Glenn, Neha Gogia

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD) is a neurodegenerative disease, which affects the mental functions of the patients. This disorder progresses with age and does not have a cure to-date. One of the reasons for the manifestation of AD is the accumulation of amyloid-beta-42 (A $\beta$ 42) proteins. In our study, we have used *Drosophila* as our model organism (as 75% of the genetic machinery is conserved between flies and humans), and have developed a model where when human A $\beta$ 42 is misexpressed in the differentiating eye, triggers cell death in the retinal neurons. We have also identified a soy-based anti-inflammatory protein, Lunasin, which can block A $\beta$ 42 mediated cell death by downregulating the NFkB pathway (which lead to translation of apoptotic proteins of Jun-N Terminal Kinase (JNK) pathway). In order to discern the exact mechanism by which Lunasin prevents neuronal cell death (caused by the accumulation of A $\beta$ 42 proteins), we have developed transgenic flies, which can produce human A $\beta$ 42 and A $\beta$ 42+Lunasin in the *Drosophila* eye. Our hypothesis states that manipulating the Relish protein complex of the Imd-NFkB pathway could lead to activity variation in JNK pathway in A $\beta$ 42+Lunasin flies. To test our hypothesis, we used GAL4/UAS system genetic technique and misexpressed relish and relish RNAi in human A $\beta$ 42, A $\beta$ 42+Lunasin background, and checked for the resultant phenotypes in (1) the larval eye imaginal discs and in (2) the adult eyes. Our data showed that downregulating Relish rescues neurodegenerative phenotypes seen in Alzheimer's flies. It suggests that the Imd-NFkB pathway plays a positive role in Lunasin's ability to mitigate the neuronal cell death caused by the accumulation of A $\beta$ 42 plaques. These studies have significant bearing on the use of NFkB members as biomarkers or druggable targets and generate new insights into the mechanism by which A $\beta$ 42 mediated neurodegeneration cell death can be blocked in the future.

## Changes in a western Ohio old-growth forest community before and after invasion by emerald ash borer

College of Arts and Sciences: Biology

Stander Undergraduate Fellowship Awardee

Poster - Independent Research

**PRESENTERS** Julia I Chapman, Mitchell John Kukla, Corey Michael Kuminecz

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The emerald ash borer (EAB; *Agrilus planipennis* fairmaire) is an invasive insect species in North America that has devastated *Fraxinus* (ash) populations in the Great Lakes region and northeastern U.S.. Many forests are losing a significant number of *Fraxinus* trees and the implications of this widespread disturbance is not yet clear. The aim of this study is to understand how EAB-related tree mortality is impacting compositional change in a west central Ohio old-growth forest. A set of 32 nested plots were established in Drew Woods State Nature Preserve in 2011 and used to sample the overstory layer (314 m<sup>2</sup>; stems  $\geq$  2.5 cm diameter at breast height), sapling layer (10 m<sup>2</sup>; stems  $<$  2.5 cm dbh and  $>$  50 cm in height), and seedling layer (1 m<sup>2</sup>; stems  $<$  50 cm in height). These plots were resampled in 2017 to investigate the composition of tree species over seven years during which the majority of *Fraxinus* trees died from EAB infestation. In the overstory, basal area of live *Fraxinus* decreased from 151.4 m<sup>2</sup> ha<sup>-1</sup> in 2011 to 1.68 m<sup>2</sup> ha<sup>-1</sup> in 2017. The basal area of dead *Fraxinus* increased from 33.5 m<sup>2</sup> ha<sup>-1</sup> in 2011 and to 132.3 m<sup>2</sup> ha<sup>-1</sup> in 2017. Further analysis will investigate how the relative abundance and stem density of tree species other than *Fraxinus* have changed during this time period. These findings can provide insight into the future successional trajectory of forests that have been infested with emerald ash borer.

## Beyond the Macro: exploring micronutrients in insect communities

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Kaitlin Marie Gawkins, Meg Elizabeth Gramza

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Macronutrients are widely considered to be an important limiting factor for insect herbivore populations in grassland ecosystems. However, a potential co-limitation by micronutrients has long been overlooked. We are studying the effect of soil micronutrients on herbivore community composition in coastal tallgrass prairies of Texas with a large-scale multi-nutrient, fertilization experiment manipulating Ca, K, and Na in concert with N and P. Initial results indicated that orthoptera abundance and diversity are co-limited by macronutrients and sodium. To determine if these effects arose through the herbivores feeding more heavily on plants with NP and Na added, we used in-lab choice trials with seven species of orthoptera from three feeding guilds with leaves from four plant species (2 grasses and 2 forbs) that were grown in treatments with either ambient soil nutrients or Na, NP, or Na plus NP added. We then determined how much each individual ate of each treatment leaf at the end of the 48 hour trial. With no preference and a choice of 4 leaves, each leaf should make up on average 25% of each individual's total consumption. We compared each individual's feeding to these expected amounts and used pairwise t-tests to determine whether preferences existed. Pooling across all individuals, orthopterans chose the NP+Na leaves significantly more than any other leaf type. This finding suggests that orthopterans respond directly to leaf chemistry changes arising from our treatments and have important implications for management practices: orthopterans are considered major pests to agricultural systems and are controlled with billions of dollars of pesticides annually. However, because NP and Na in soils are both enhanced with current agricultural practices, our findings suggest that humans could actually be causing these insect herbivores to thrive and become abundant in agricultural systems by adding these limiting nutrients.

## Fear no weevil: insect communities as indicators of restoration in an urban prairie network

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Erin Butrica, Amanda N Finke

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Tallgrass prairies are one of North America's most threatened ecosystems, having been depleted to 4% of its original range. Because of this, conservationists have been working to protect the remaining prairies, as well as restoring and constructing new ones. However, studies are showing that these restored and constructed prairies may not support the same biodiversity and ecosystem services as natural prairies. Most of the biodiversity within these prairies is composed of arthropods. We determined how insect communities from remnant prairies (n=5) compare to that of constructed prairies (n=5) and old fields (n=4). At each site, we collected 4 samples of arthropods by sweepnetting 25 times each, pooling samples, and identifying all individuals to order. We also sampled plant and soil community characteristics. We saw that habitat type affected the number of Coleoptera (beetles), with more beetles in remnant prairies than restored or constructed prairies. Individuals from this order were identified to family, and we saw higher numbers of Phalacridae (shining flower beetles) and Curculionidae (weevils) in the remnant prairie sites. Because few studies look at organisms other than plants to determine success of restoration efforts, we see these beetles as potential indicator species that may help land managers in determining the success of prairie restorations.

## Stimulating anaerobic respiration primes anaerobically grown *Listeria monocytogenes* for intracellular growth

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Nathan C Wallace

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Listeria monocytogenes* (*Listeria*) is a Gram positive facultative organism whose lifestyle ranges from a saprophyte to an enteric intracellular pathogen. *Listeria* is generally ingested from contaminated food products, and as it transmits through the gastrointestinal tract its environment becomes increasingly anoxic. Currently it is not clear how *Listeria* adaptations to the fluctuating oxygen levels contribute to its pathogenesis. Therefore, we set out to understand what role anaerobic respiration plays in *Listeria* pathogenesis. Previous work in our lab has shown that anaerobically cultured *Listeria* has decreased intracellular growth in a tissue culture infection model using RAW264.7 macrophages. We hypothesized that this may be due to anaerobically cultured *Listeria* taking longer to switch from fermentation to aerobic respiration. This hypothesis was supported by the observation that, compared to an aerobic inoculum, an anaerobic inoculum exhibited an extended lag phase during aerobic growth in vitro. Using a tetrazolium reduction assay, we confirmed that anaerobically cultured *Listeria* have decreased reducing power, indicating decreased electron transport chain (ETC) activity. To determine whether the reduced ETC activity under anaerobic conditions is an important factor in *Listeria* pathogenesis, we supplemented the cultures with fumarate as an alternative electron acceptor to stimulate ETC activity and measured listeriolysin O (LLO) production as well as intracellular growth. When we supplied exogenous fumarate to *Listeria*, we noticed an increase in the reducing power as well as LLO production in anaerobically grown *Listeria*, compared to no fumarate controls. Moreover, fumarate supplementation restored the intracellular growth of anaerobically grown *Listeria* to the same level of aerobically grown *Listeria* inside macrophages. These findings point to the crucial role of anaerobic respiration in *Listeria* anaerobic virulence regulation.

### **Cracking the Shell: An Investigation of Shell Repair in the Oyster, *Crassostrea virginica***

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Alyssa Ashley Outhwaite

**ADVISORS** Douglas C Hansen, Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Mollusc shell formation has been an intriguing phenomenon for decades and current research efforts represent a paradigm shift in how oyster shell formation occurs. The older model of shell formation suggests a lack of cellular components as transport vectors for organic and mineral components. However, current research focuses on the potential role of oyster blood cells, hemocytes, in moving organic and mineral components to the shell formation front. A protein biomarker, the amino acid L-3,4-dihydroxyphenylalanine (L-DOPA), is unique to the proteins involved in insoluble organic matrix formation. Tracking the location and temporal occurrence of L-DOPA-containing proteins reveals the potential role of cells in shell repair. Three notch-repair experiments were conducted: a short term 36-hour notch-repair study, a mid-term 7-day notch-repair study, and a long term 8-week notch-repair study. At discrete time intervals, selected oyster compartments of hemocytes, mantle tissues, hemolymph, and nascent shell were sampled to determine the spatial and temporal distributions of the DOPA biomarker. Preliminary results show an increase in DOPA concentration in hemolymph from 0 to 48 hours. Conversely, hemocytes show a decrease in DOPA over time, with the greatest amount of DOPA present at 0 hours and a subsequent decrease over the course of repair. Additionally, nascent shell was analyzed during the 8-week study through the use of scanning electron microscopy (SEM). Analysis of the shell surface showed haphazard crystal formation under normal mineral deposition with crystals irregular in size, shape, and general placement. Newly formed shell from a notched specimen at 48 and 96 hours after notching; however, is characterized by directional and more uniformly shaped crystals. Together these results suggest that hemocytes are selectively shuttling and releasing protein resources to areas of shell repair and provide additional support for the cellular mediated shell formation model, where hemocytes play an active role in materials transport.

### **Drosophila Melanogaster Imaginal Disc Model To Identify And Determine The Regeneration Potential Of Novel *Notophthalmus Viridescens* (Red-Spotted Newt) Genes.**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Amr Abdulkarim Alghamdi, Abijeet Singh Mehta

**ADDITIONAL AUTHORS** Luz-Madriral (Miami University), Panagiotis A. Tsonis

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Notophthalmus viridescens* possess amazing capabilities to regenerate their organs but molecular-genetic mechanism driving regeneration have been hindered due to lack of genetic tools. However, *Drosophila* imaginal discs, the primordia for adult fly structures, exhibit stem cell like potency and serve as powerful genetic tools to address fundamental problems in regeneration. Using this system, we demonstrated the regenerative role of 5 novel newt proteins. These proteins, having new sequence motifs, have no counterparts in public databases, were identified by denovo assembly of newt transcriptome combined with proteomic validation. Using transgenic approach these genes were misexpressed in *Drosophila*, and RNA seq was performed on mRNA sample from third instar larva. Gene ontology terms related to development, apoptosis and cell cycle were highly enriched in the group of differentially regulated *Drosophila* transcripts. To determine their regenerative potential, we misexpressed candidate genes in the early eye mutant background. Surprisingly, these genes exhibit robust potential to replace missing tissues by inducing compensatory proliferation and blocking cell death. Mitotic index fold change being  $6 \pm 1.5$ , and frequency of phenotype rescue was 70%. Using Retinal determination (RD) gene expression we demonstrated that rescued mutant undergo proper differentiation. We found highly conserved

Wingless/Wnt, and Jun-N-terminal kinase (JNK) signaling pathway components were downregulated to promote rescue in the domain where candidate genes were misexpressed. These pathways have been implicated in tissue regeneration in *Drosophila*. We further wanted to test if candidate genes can globally trigger regeneration in all tissues, and to address this question we used an established model for regeneration in wing imaginal disc. Our preliminary data from this model demonstrates that regeneration potential of candidate genes is not confined to the type of tissue or developmental stage. We therefore have identified a novel component of regeneration tool kit in newt that can trigger regeneration response in other organisms by employing highly conserved signaling pathways. In future, these studies can have a significant bearing in the field of tissue repair and maintenance. Keywords: Candidate genes, Newts, *Drosophila*, Regeneration, Imaginal Discs.

## Growth Regulatory Pathway collaborates with Axial Patterning Genes to regulate Patterning and Growth in *Drosophila* Eye

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Neha Gogia

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In all the multicellular organisms, organogenesis requires axial patterning to determine Antero-Posterior (AP), Dorso-Ventral (DV), Proximo-Distal (PD) axes. Any deviation in these axes during development leads to congenital birth defects. In our model system, *Drosophila melanogaster* (a.k.a fruit fly), Dorso-Ventral (DV) patterning marks first lineage restriction event. We have identified defective proventriculus (*dve*), an ortholog of SATB homeobox 1 (special AT-rich sequence binding protein 1), as a new member of DV patterning genes hierarchy. We have shown that *dve* acts downstream of *pannier* (*pnr*, a GATA-1 transcription factor), and upstream of *wingless* (*wg*) in dorsal gene hierarchy. Loss-of-function (LOF) of *dve* or *pnr* results in dramatic dorsal eye enlargements, whereas Gain-of-function (GOF) of *dve*, *pnr* suppresses eye specific fate. We have demonstrated that *Wingless* (*Wg*), (1) is downstream target of Hippo growth regulatory pathway (highly conserved) in eye, (2) acts downstream of *dve*, (3) exhibits similar eye enlargement and suppression phenotypes (upon LOF, GOF respectively), and has been shown to play a role in growth. Here, we present that, DV patterning genes interacts with Hippo signaling to regulate their common downstream target, *Wg* during developing *Drosophila* eye. Our data (using GOF, LOF) states that (1) These two unrelated pathways are related and interacts antagonistically, (2) Activating Hippo signaling suppresses *dve*, *pnr* expressing cells, downregulates *Wg* and changes head, antennae specific fate to an eye, (3) Blocking cell death activity of *hpo* (using UAS-*p35*, anti-apoptotic) doesn't affect its ability to undergo differentiation, (4) Growth regulatory pathway regulates the expression of DV patterning genes (*dve*, *pnr* acts downstream of Hippo pathway), and that (5) GOF/LOF of *dve*, *pnr* does not affect the expression of Hippo downstream reporters *diap1* and expanded in developing eye of *Drosophila*. These studies present new genetic interaction between two unrelated pathways to regulate growth and patterning of an organ.

## Two clone system to determine complex signaling between wild-type and A $\beta$ 42 expressing neurons in Alzheimer's Disease.

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Sean T Connelly, Garrett Michael Grissim, Sean Andrew Kelly, Ankita Sarkar

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's Disease (hereafter AD) is an irreversible neurodegenerative disease causing death of millions of elderly people every year. One of the reasons for AD is abnormal cleavage of the Amyloid precursor protein (APP), which forms a 42 amino acid long hydrophobic polypeptide (hereafter A $\beta$ 42) which form aggregates leading to amyloid plaques. This A $\beta$ 42 forms plaque that leads to neuronal cell death. We are trying to understand the genetic underpinnings behind the onset of this deadly disease using *Drosophila melanogaster* eye as our model system. We have generated and optimized a two-clone system in our lab to understand the cross-talk between the plaque forming neurons and the adjacent wild type neurons. The onset of AD initiates with a few neurons which start producing amyloid plaques, which then triggers cell death. One of the questions is: Which neuronal population is affected? Our system utilizes the FLP/FRT mediated recombination to produce two types of neuronal cell population where strong GFP reporter marks the A $\beta$ 42 misexpressing neurons, and the neighboring wild-type neurons are marked by the absence of GFP. Our preliminary data suggests that the A $\beta$ 42 misexpressing neurons survive at the expense of the neighboring wild type cells. Thus, we believe that there are certain signals, which emanates from these A $\beta$ 42 plaque producing neurons towards the wild type neurons, which causes them to die. We have identified evolutionarily conserved Jun-N-Terminal Kinase (JNK) Signaling pathway as one of the genetic modifiers of A $\beta$ 42 mediated neurodegeneration, which induces neuronal death. With the help of our two-clone system, we want to understand which neuronal cells (A $\beta$ 42 misexpressed vs wild type cells) and how, the JNK signaling triggers cell death. We will test reporters and antibodies against the members of JNK signaling pathway to address our hypothesis. Furthermore, identifying the genetic biomarkers of the Alzheimer's disease with the help of our genetic tool can be utilized in finding therapeutic targets in the future.

## Listeriolysin O production is regulated by SCFAs and oxygen in *Listeria monocytogenes*

## College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Erica Marie Rinehart**ADVISORS** Yvonne Y Sun**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Listeria monocytogenes* (LM) is foodborne pathogen that secretes listeriolysin O (LLO), a pore-forming toxin to establish its intracellular life cycle inside host cells. However, how the environment in the intestine that has both an oxygen gradient (low oxygen to no oxygen) and is enriched in short chain fatty acids (SCFAs) effects LM virulence regulation and pathogenesis has not been determined. To better understand LLO production in response to relevant environmental conditions found during LM transit through the intestinal lumen, a reporter strain and hemolytic assays were used to examine the effect of SCFAs on the transcription and the activity of LLO, respectively. We characterized the LM membrane fatty acid composition in response to SCFAs using FAME analysis. This allowed us to examine the role of membranes as an intermediate signal in LM response to SCFAs. In total, we found that that transcription and LLO production was significantly affected by SCFAs and that LM response to SCFAs was influenced by oxygen. Significant alterations in membrane fatty acids were also seen in SCFA-treated LM. Therefore, LM has the capability of responding to the SCFA-rich environment, in both virulence gene regulation and fatty acid metabolism, during intestinal transit and that individual variations in SCFA abundance may contribute to susceptibility to LM infections.

### The FUN(gi) Kind of Colonization: effects of micronutrients on mycorrhizal association with little blue stem

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Kiersten Paige Angelos, Beth Margaret Fuchs, Kaitlin Marie Gawkins, Shania E Hurst, Emily E Jones, Ryan William Reihart**ADVISORS** Kathleen A Kargl, Chelse M Prather, Megan A Rua (Wright State University)**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Arbuscular mycorrhizal (AM) fungi are ubiquitous throughout the plant kingdom, and particularly important in grasslands. AM fungi deliver mineral nutrients such as nitrogen (N) and phosphorus (P) to plants in exchange for carbohydrates. Despite this important role in N and P cycling, their interactions with micronutrients, like calcium, are largely unexplored. Interactions with calcium (Ca) may be particularly important because of its role in the intracellular signaling system that helps hyphal tip growth. We determined how additions of Ca both alone and in conjunction with N and P affect the colonization rates of AM fungi in little blue stem (*Schizachyrium scoparium*). This perennial grass is a dominant graminoid in prairies across the US, including our study site, a coastal tallgrass prairie in Texas. Using a carbon steel soil auger (7.2cm diameter), we sampled *S. scoparium* roots in a large-scale (30m x 30m plots), factorial-designed fertilization experiment that manipulated Ca and N&P (n=8 replicate plots x 4 *S. scoparium* individuals x 4 treatments=128 total root samples). Each sample was washed to isolate root samples and stained with trypan blue, and we determined AM fungal colonization by quantifying the number of arbuscules, hyphae, and vesicles for each individual. We saw that Ca with N&P had significant effects on the overall rate of AM fungal colonization. We also saw independent effects of each nutrient on the degree of hyphal and vesicle colonization in the roots of *S. scoparium*. Taken together, these results suggest that AM fungi may benefit from Ca inputs, but this does not extend to an increased positive effect on the plant. Better understanding its role in belowground and aboveground processes is crucial to maintaining ecosystem functioning. This work represents an important first step to understand more fully the effects of micronutrients on mycorrhizal fungi in terrestrial ecosystems.

### Role of M1BP in eye development of *Drosophila melanogaster*

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Hannah Corinne Gordon, Abijeet Singh Mehta, Ankita Sarkar, Kaitlyn E Strickland**ADVISORS** Madhuri Kango-Singh, Amit Singh**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Regulation of transcription in multi-cellular organisms is responsible for generating diversity in cell type and final patterning and growth of an organ. The regulation of gene expression can be present at multiple levels like assembling pre-initiation complex at promoters or regulation of gene expression by micro RNA. Recently, a novel transcription factor M1BP (TF; Motif 1 binding protein) has been identified which is required to regulate a large class of paused genes. However, the role of the Motif 1 binding protein is unknown in the eye development. We employed *Drosophila melanogaster* eye model to understand its role in patterning, growth and development. M1BP is highly conserved across the species and encodes a 55kDa protein containing five C2H2 zinc-fingers domains. A battery of highly conserved genes regulates *Drosophila* eye development. In our studies, we examine the effects of Motif 1 Binding Protein (M1BP), and its effects on the control of gene expression during eye development of the *Drosophila melanogaster*. Our preliminary data suggests that absence of M1BP function in dorsal and ventral eye margins results in the suppression of eye fate and the suppression of the gene from the entire eye gives us a head loss phenotype. We also hypothesize that the loss of function of M1BP leads to the change of the fate of peripodial epithelium cells to disc proper in the eye imaginal disc. The above data will be presented in our poster.



## Understanding how the loss of Dronc function affects apoptosis

College of Arts and Sciences: Biology

Poster - Course Project, 201810 BIO 421 P1

**PRESENTERS** Karishma Sanjay Gangwani, Hannah Marie Scharf, Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Cancer is caused by mutations in cells that disrupt signals for growth and division. Apoptosis, a system of programmed cell death, is controlled by genes and impacts cell survival, proliferation, and differentiation. Dysregulation of apoptosis is a significant cause of cancer, as mutated tumor cells show uncontrolled growth and elude cell death. Because of this, it is crucial to study how the genes involved in cell growth and death pathways become dysregulated in a way that causes tumor creation, so that cancer biology can be better understood and possible therapeutic measures can be pursued. One pathway commonly dysregulated in human tumors, the Hippo pathway, was identified in *Drosophila melanogaster* and is conserved evolutionarily in humans. Former research in our lab has shown that the Hippo pathway interacts with initiator caspase Dronc, which is the first target gene to be negatively regulated by this pathway, in the regulation of apoptosis. We hypothesize that loss of Dronc function would enable unchecked cell proliferation. To assess this, we are using RNAi to interfere with Dronc expression. We will also use markers like cyclin A, B, and E to evaluate cell proliferation through immunostaining and confocal microscopy. Here we present our findings on the how the loss of Dronc affects cell proliferation.

## Post-Freeze Viability of Erythrocytes from *D. chrysoscelis*

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Loren Vanessa Geiss

**ADVISORS** Carissa M Krane, Clara do Amaral, James Frisbie, David Goldstein

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Cope's gray treefrog, *Dryophytes chrysoscelis*, is a freeze tolerant frog that survives the freezing of extracellular fluids during winter. Throughout the fall months the frogs are exposed to a gradual decrease in temperature, becoming cold-acclimated. Cold-acclimated treefrogs have elevated plasma levels of glycerol and urea, solutes that function as cryoprotectants by reducing the intra- and extracellular flux of water during freezing and thawing. To minimize cell damage, glycerol and urea need to be taken up by erythrocytes through a transmembrane protein, aquaglyceroporin HC-3. It is hypothesized that erythrocytes frozen in solution containing glycerol/urea would have greater post-freeze (PF) viability than cells frozen without glycerol or urea. It is further hypothesized that cells frozen with naturally accumulating, and HC-3 permeating, solutes (glycerol and urea) would have enhanced PF viability compared to cells frozen with solutes that do not accumulate during cold acclimation (glucose, NaCl, sorbitol). In this study, erythrocytes were obtained from warm-acclimated (22°C) or cold-acclimated (4°C) frogs. Cells were suspended in phosphate buffered saline (PBS) ± solute and incubated for 30 minutes at -8°C. Percent hemolysis was calculated as the amount of hemoglobin leaked from erythrocytes over the total amount hemoglobin in the erythrocyte sample. PF viability was 2.6-fold greater in cells from cold-acclimated frogs compared to cells from warm-acclimated frogs. Cells from warm- and cold-acclimated frogs enhanced PF viability when frozen in PBS containing urea (2.8-fold,  $p < 0.005$  and 0.6-fold,  $p < 0.001$ , respectively). PF viability of cells frozen in PBS containing glycerol improved when cells were from cold-acclimated frogs (0.6-fold,  $p < 0.005$ ). Although results support the involvement of glycerol and urea in the cryoprotection of *D. chrysoscelis*, enhanced viability of cells from cold-acclimated frogs, compared to cells from warm-acclimated frogs, suggest that changes other than glycerol and urea accumulation are involved in the freeze tolerance of *D. chrysoscelis*.

## Understanding the Repopulation of Glioblastoma in *Drosophila* Model System

College of Arts and Sciences: Biology

**Stander Undergraduate Fellowship Awardee**

Poster - Honors Thesis

**PRESENTERS** Leah Dawn Bullock

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Glioblastoma Multiforme (GBM) is the most common form of malignant brain tumors, accounting for about 52% of primary brain tumors. Patients diagnosed with GBM typically die within a few months after diagnosis. Standard treatment consists of surgery, radiation therapy, and chemotherapy. GBM has an unfavorable diagnosis due to the high rates of tumor recurrence. The cause of the repopulation of the tumor after treatment is currently unknown; therefore, there is a need to study the repopulation of GBM in more detail. We have created a simple glioma model in *Drosophila melanogaster* to study the effects of treatment on tumor size and repopulation of the tumor. We have created the glioma model by suppressing Pten while overexpressing oncogene Ras in glial cells in order to induce a tumor. Flies with genotype UAS<sup>Pten</sup> RNAi; UAS<sup>Ras</sup>V12; Repo Gal4 UASGFP developed aggressive brain tumors and failed to survive to the adult stage. 1st instar larvae of this genotype were exposed to different dosages of X-ray radiation to study the radiation sensitivity of glioma larvae. We utilized 3.5 Gy of radiation to carry out further experiments. We found there is a significant reduction in tumor size in the larvae exposed to X-ray compared to the unexposed samples; however, there is still repopulation of the tumor after X-ray exposure. Through the use of immunohistochemistry, we found that there is significant reduction

in Glial cells, neuroblasts, and neurons after X-ray exposure. We plan to further our study by looking into the effects of radiation on the ganglion mother cells and dying cells of the brain. Since the pathways in this study are conserved from flies to mammals, these findings can be utilized in other model systems and in humans. These findings have the potential to lead to possible treatments for glioblastoma tumors in humans.

### Investigating Cell-Cell Interactions through Wg and Yki signaling in Drosophila Glioma

College of Arts and Sciences: Biology

**Stander Undergraduate Fellowship Awardee**

Poster - Honors Thesis

**PRESENTERS** Logan Joseph Roebke

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Glioblastoma multiforme (GBM) is a devastating form of primary brain cancer with poor prognosis. Capitalizing on the mutations found in GBM patients and the similarities between mammalian and Drosophila genes involved in glial cell biology, Drosophila glioblastoma models have been established that show similarities to anaplastic glia from high-grade human glioma. High grade glioma is known to be recurrent and therapy resistant. These aspects of GBM lead us to ask how different genetic signals (JNK, Wg and Yki) contribute to promoting glioma, and if interactions between glioma cells and the neighboring stromal cells play a role in the key aspects of disease presentation- the rapid growth, the therapy resistance, and the recurrent phenotype. So far, we have downregulated Wg and Yki to analyze their effects on glioma growth. Here we present our progress from these studies.

### Wingless, a mediator of crosstalk between Amyloid-beta 42 expressing and wild-type neurons in Alzheimer's disease

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Ankita Sarkar

**ADDITIONAL AUTHORS** Dr. Julia Kofler (University of Pittsburgh Medical Center)

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD), a common form of dementia and an age related progressive neurodegenerative disorder, manifests as memory loss and reduced cognitive ability. One of the hallmarks of AD is formation of the Amyloid-beta 42 (hereafter A $\beta$ 42) plaques, which triggers oxidative stress due to aberrant signaling and finally results in the death of neurons. However, the exact mechanism causing cell death is still not well understood. We misexpressed high levels of human A $\beta$ 42 protein in the developing fly retina, which mimics AD like neuropathology. In a forward genetic screen, we identified members of highly conserved Wingless (Wg) signaling pathway as modifiers of the A $\beta$ 42 mediated neurodegeneration. Misexpression of negative regulator of Wg like Shaggy kinase (sgg) or a dominant negative form of Drosophila T-cell factor (dTCFDN5) or blocking Wg transport specifically by downregulating Porcupine (using porcupineRNAi) rescued A $\beta$ 42 mediated neurodegeneration by reducing the number of dying cells and restoring the axonal targeting from the retina to the brain. It is also known that Wg induces cell death in the early eye developmental stage of Drosophila. We therefore want to understand by what mechanism and in which cells the Wg signaling is triggering cell death, whether it's the A $\beta$ 42 misexpressing cells or the neighboring wild type cells. In order to approach this question we have developed a two clone system in our lab to understand the crosstalk between the two cell populations, where we have shown that the wild type neighboring cells are undergoing cell death compared to the A $\beta$ 42 misexpressed cells.

### Investigation of the Role of Mitochondrial Dysfunction as a Trigger for Neurodegeneration in Alzheimer's disease

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Neha Gogia, Lydia Christine Payton, Ankita Sarkar

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that affects the cognitive function and memory of those affected. It results from plaques formed by the abnormal cleavage of the Amyloid Precursor Protein (APP), which result in the formation of a 42 amino acid polypeptide, also known as amyloid beta 42 (A $\beta$ 42). Accumulation of these hydrophobic A $\beta$ 42 plaques triggers neuronal cell death in the central nervous system. However, the reason for this abnormal cell death still remains unknown. A possible explanation involves the role of mitochondrial dysfunction, as mitochondria carry out many vital cellular functions in a cell, including ATP production, reactive oxygen species production, and apoptosis. This study uses Drosophila melanogaster - the fruit fly - as the model organism, as 75% of the genetic machinery is conserved between flies and humans and much of the information generated using this model can be extrapolated to humans. This study uses an AD fly model in which human A $\beta$ 42 peptides can be misexpressed in the Drosophila eye using the GAL4/UAS system. In our study, we have identified (1) alpha-ketoglutarate dehydrogenase and (2) pyruvate dehydrogenase as potential enzymatic modifiers of the human A $\beta$ 42 neurodegeneration. To investigate their effect on Alzheimer's, we used the GAL4/UAS system, and misexpressed the GOF/LOF forms of the genes coding these enzymes

along with human A $\beta$ 42 in the fly eye and checked the resultant phenotypes in both larval eye antennal imaginal discs and in adults. Our results showed partial rescue in the LOF of alpha-ketoglutarate dehydrogenase, which clearly indicates that the enzyme plays a major role in AD progression. In the future, we will test the GOF of both enzymatic modifiers in further experiments. This study has significant bearings on understanding how certain enzymatic mitochondrial machinery and metabolism affects AD progression.

## Role of Calcium Signaling Pathway in Rescuing A $\beta$ 42 Neurodegeneration in *Drosophila*

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Neha Gogia, Chris Y Kang, Dena M Schaeffer

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's Disease (AD) is a neurodegenerative disease, common in more than five million individuals in the United States (US) alone, making it the sixth leading cause of death in the US. While currently there are no cures for the disease, there are many ongoing studies, which are using the *Drosophila melanogaster* model, to find a way to prevent and slow down AD. We have used *Drosophila* as our model organism; *Drosophila* eye as our model organ (due to highly conserved genetic machinery between flies and humans). We have developed a transgenic fly model of AD where we misexpress high levels of human A $\beta$ 42 peptides using GAL4/UAS system approach, using this system, misexpression is targeted in the differentiating photoreceptor neurons in the *Drosophila* eye and can be explained to address questions pertaining to whether activating or deactivating certain pathways can rescue A $\beta$ 42 mediated neurodegeneration. We have found that members of calcium signaling pathway acts as the modifier of A $\beta$ 42 mediated neurodegeneration. In order to test our hypothesis, we misexpressed the loss-of-function form (using RNAi) of six components of calcium signaling pathway (which are stimRNAi, sercaRNAi, ora1RNAi, inx2RNAi, ip3rRNAi, and plc 21cRNAi) in A $\beta$ 42 background in the eye, and observed the effects in both eye-antennal imaginal discs and adult eyes. Our results showed 100% eye rescue with all 6 components of calcium signaling pathway at 29C, which clearly states that inactivation of calcium signaling pathway blocks A $\beta$ 42 mediated neurodegeneration. Previous studies on calcium signaling pathway showed a role in deadly diseases like cancer and other fatal diseases. Our studies show a new role of calcium signaling in neurodegeneration disorder like AD.

## Aquatic macroinvertebrate density in headwater streams with varying intensities of riparian Amur honeysuckle (*Lonicera maackii*) invasion

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Jenea Imani Adams, Eric Bradley Borth, Taylor Melissa Buskey, Julia I Chapman, Kevin Custer, Mitchell John Kukla, Corey Michael Kuminecz, Michelle Nicole Little, Sean David Mahoney, Meg Eileen Maloney, Joseph Michael Murphy, Taylor Marie Sparbanie

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Headwater streams in the midwestern United States are an important ecosystem because they are home to key macroinvertebrate species and serve as the starting point for freshwater river systems. According to the river continuum concept, any terrestrial inputs to headwater streams can influence biotic communities and abiotic conditions downstream. Amur honeysuckle (*Lonicera maackii*) is an invasive shrub species prominent in the midwestern U.S. whose allelopathic properties have proven detrimental to local species biodiversity. We hypothesized that increasing Amur honeysuckle density along headwater streams would alter the diversity of aquatic macroinvertebrate communities. Five sites located in Montgomery and Miami Counties, Ohio were chosen to represent varying *Lonicera maackii* density along the banks of headwater streams: one heavily invaded site, two moderately invaded sites, and two reference sites (little to no invasion). A 30-meter section of stream at each site was divided into five plots that were six-meters long and were used to sample aquatic macroinvertebrates for five consecutive seasons. A dip net was moved across each plot for 60 seconds, and macroinvertebrates were then separated from the collected debris, preserved in alcohol, and brought back to the lab where they were sorted into taxonomic groups. The total number of macroinvertebrates collected did not vary greatly among sites within each season. A preliminary assessment of community composition showed that there was a greater relative abundance of Diptera and Oligochaeta at the heavily-invaded site in fall and winter compared to the moderate and reference sites. The relative abundance of Trichoptera was lower at the heavy site than the moderate and reference sites in fall, spring, and summer. Further analyses are required to understand how community composition varies among the sites and how such differences relate to honey-suckle invasion and macroinvertebrate feeding mechanisms.

## Drivers of Post-Fire Regeneration in Larch Forests of Northeastern Siberia

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Eric Bradley Borth

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Arctic is warming at an alarming rate, a phenomenon which has been causing more frequent and severe wildfires in boreal forests. The Cajander larch (*Larix cajanderi*) forests of Siberia are particularly important because they cover an immense area of

carbon-rich permafrost soil, one of the largest terrestrial carbon sinks. The fate of this belowground carbon is intimately tied to the structure of these larch forests. Due to the fact that forest structure is largely determined by the establishment of new seedlings after forest fires, we seek to learn more about how these changes in fire regimes may change the factors that drive seedling establishment. We examine 6 Cajander larch stands in northeastern Siberia that have been burned in the past 15 years. We evaluate the importance of microsites that favor larch establishment (deemed "safe sites"), a concept that has been anecdotally recorded, but not rigorously studied. We analyze the strength of seedling preference by comparing the percentage of seedlings that establish on safe sites to the percentage of the land area that is covered by safe sites. This analysis is being carried out in burned sites with varying seed availability to determine whether seed limitation affects safe site preference. Based on our current data, we hypothesize that seed availability will be the most important driver of regeneration, and that safe sites will be more important where there is greater seed limitation. These results will help us understand the patterns of change in larch forests in the face of climate change.

### **The queen craves calcium: micronutrient effects on litter arthropods in a coastal tallgrass prairie**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Kiersten Paige Angelos, Jesse Chapman Alexander Chapman, Kaitlin Marie Gawkins, Shania E Hurst, Ryan William Reihart

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The biogeochemistry of earth is being redistributed through various anthropogenic activities; however, the consequences of these alterations on high trophic levels remains unknown. Along the coast, for example, marine-derived nutrients are being deposited by large tropical storms, which may be increasing in intensity and frequency with climate change. These storms have the potential to deposit large amounts of micronutrients, which are less abundant in living tissue, and could affect the abundance and diversity of litter arthropods. Despite understanding how macronutrients (nitrogen and phosphorus) affect litter arthropods, the effect of micronutrients (calcium, sodium, and potassium) remains unknown. To determine how biogeochemistry affects litter arthropods, we utilized a factorial, fertilization experiment that manipulates macro- and micronutrients (N&P, Ca, K, and Na; all possible combinations: 16 treatments x 8 replicates = 128 plots) in large 30 m x 30 m plots at the University of Houston Coastal Center near Houston, TX. Pitfall traps were installed in May and July 2017 to collect litter arthropods, which were sorted and identified to the lowest possible taxon. Results show that *Nylanderina fulva*, an invasive crazy ant, was the dominant litter arthropod across all treatments, as this ant composed >95% of the entire litter community. Additionally, predatory arthropods were limited by Ca, but were suppressed by the combination of Na and K. Arthropod prey in this ecosystem were most abundant in the combination of macronutrient (N&P) and Na treatments, indicating that prey are co-limited by macronutrients and Na. These results indicate that different trophic levels, predators and prey, can be limited by different nutrients within the same ecosystem, while also giving insight as to what makes an invasive species so successful.

### **Invasional meltdown on the Texas coast? Positive interactions between an invasive plant, an invasive ant, and a non-native moth on the endangered coastal tallgrass prairie**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Emily E Jones, Emma Quill Kaufman

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Positive interactions between invasive species may facilitate and amplify the invasive success of each interacting partner, leading to "invasional meltdowns." Coastal tallgrass prairies, imperiled ecosystems along the Gulf Coast, are currently under threat by non-native species from multiple trophic levels: the Chinese tallow tree (*Triadica sebifera* L.), the omnivorous tawny crazy ant (*Nylanderina fulva* Mayr), and most recently, an adventive, hypermetamorphic, herbivorous moth (*Caloptilia triadicae* Hodges). Previous research demonstrated that invasive Chinese tallow induces extrafloral nectar (EFN) in response to specific, chewing herbivores, and tawny crazy ants have been observed consuming tallow EFN on the prairie. However, the nature of interactions between these three species is currently unknown, and studies of tri-trophic interactions between spatially-associated, non-coevolved invasive species are underrepresented in the ecological literature. We hypothesize that invasive Chinese tallow, when attacked by the non-native moth, confers a nutritive resource to the ecologically dominant invasive ant. To determine the nature of the interactions between these species, we will experimentally manipulate EFN induction in potted Chinese tallow saplings using various levels of *Caloptilia* infestation, conduct complementary laboratory feeding trials with the ants, and measure the effect of ant exclusion on *Caloptilia* parasitism and predation on field-grown tallow trees.

### **Prairie designers: *Cambarus diogenes* as an ecosystem engineer in a coastal tall grass prairie**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Emily Katherine Brady, Shania E Hurst, Ryan William Reihart

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In a coastal tallgrass prairie, fatclaw crayfish (*Cambarus diogenes*) are an abundant, but little studied species. They burrow from the water table to the surface, carving chambers where groups of crayfish live, and assembling a soil “chimney” that they use to access the prairie. It is unknown how these crayfish that move vast amounts of soil may be affecting prairie ecosystem processes, or if soil nutrients affect where chimneys are found. Little is also known about the diet of the fat claw crayfish or their trophic placement in a prairie food web. We determined how nutrients affect the abundance of chimneys by counting the number of chimneys in a large fertilization experiment that manipulated (N&P, Ca, K, and Na). Conversely, we also determined if crayfish affect soil characteristics by measuring total soil moisture and bulk density, total nutrient concentrations, and nutrient availability from chimneys and soils at an increasing distance away from chimneys. Using our estimates of chimney abundances, we also determined how much soil crayfish move, and how they affected soil nutrient pools and availability. Additionally, we collected crayfish claws and used stable isotopes to determine the placement of this species in the prairie food web. The abundance of crayfish was affected by soil nutrients. Plots containing a combination of N&P and Ca tended to have a higher abundance. Conversely, crayfish chimneys also affected soil characteristics: the soils from chimneys were very high in available sulfur compared to soils away from chimneys. A total of 245.76 g/m<sup>2</sup> of clayey soil was likely brought up from anaerobic conditions where sulfur-reducing bacteria are present. Available potassium was lower at the base of the chimney, and got progressively higher the further you moved from the chimney. Because *Cambarus diogenes* significantly affected available soil nutrients, they likely play an important role in structuring plant communities and nutrient cycling in these rare prairies. As ecosystem engineers, their presence may be important in coastal prairie restoration and conservation. The cycling of nutrients cause by the crayfish building chimneys could manipulating what plants are able to grow in the ecosystem, and some plants need specific nutrients to be successful. Crayfish could be the key to helping preserve the fading prairie ecosystem.

## **Inhibition and Prevention of Biofilm Growth: The Effect of a Cationic and Novel Zinc Porphyrin on *Pseudomonas aeruginosa* Biofilm Formation on Different Substrata**

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** David Anthony Rivetti

**ADVISORS** Nehaben Patel, Jayne Robinson, Karolyn Hansen

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

A biofilm is a group of microbes that are found in hydrated matrices of cells and contain polysaccharides, extracellular DNA, and proteins. Bacteria growing in biofilms are often resistant to antimicrobial treatments and are able to go undetected by the immune system of their host if located within a host organism. Microorganisms that form biofilms have the potential to colonize all higher organisms and contaminate biomedical implants, leading to further complications. As a result of their physical and chemical properties, biofilms are difficult to break down and separate from their surfaces. With the increasing problem of antibiotic resistance, there is a need to further consider different treatment options to combat biofilm growth. Cationic porphyrins have the capacity to cause DNA damage in a biofilm by intercalating between the base pairs of a DNA sequence, resulting in the breakage of the strand. Certain porphyrins can be used in the absence of light, while others require photoactivation in order to achieve their optimal effects. In order to further develop a comprehensive treatment method and identify other uses for the porphyrins, additional substrata must be tested in order to determine if porphyrins can be utilized as a viable treatment option. The substrata considered include metal (stainless steel, a biomedical implant material), polyethylene (kidney dialysis tubing material), oyster shell (an easily fouled environmental surface), and glass. TMP, or 5,10,15,20-tetrakis (1-methyl-pyridino)-21H,23H-porphine, tetra-p-tosylate salt, and a novel zinc porphyrin were introduced to the *Pseudomonas aeruginosa* biofilms on the various substrata to test for efficacy in disruption of a formed biofilm as well as inhibition of biofilm growth on the substrata. In both cases, a reduction in biofilm growth was observed following viable plate counts and confocal image analysis.

## **Investigating the interaction of inflammatory pathways in tumor microenvironment using *Drosophila* cancer models**

College of Arts and Sciences: Biology

Oral Presentation - Graduate Research

**PRESENTERS** Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** Kennedy Union 211, 10:30-10:50

Tumor microenvironment (TME) consists of the tumor cells and the surrounding normal cells and plays a critical role in tumor survival and progression. Previous studies have shown presence of inflammatory components in the TME but role of these components on tumor progression is not well understood. The core inflammatory pathways that produce these components are conserved in *Drosophila*. Since 90% of tumors are epithelial in origin, we used the wing imaginal disc of *Drosophila melanogaster* to study the interaction of these key inflammatory pathways in the TME. To model the TME, we created FLP-out clones of co-activated oncogenic forms of Yki or RasV12 in polarity deficient cells marked by GFP surrounded by normal cells. These mosaic clones allow us to test changes in intercellular and signaling interactions within the tumor, surrounding its microenvironment and in distant normal cells. This clonal system recapitulates the clonal origins of human cancer and provides a distinct advantage in analyzing intratumoral and

other interactions that affect tumor growth. Using immunohistochemistry, we studied the activity of TLR, TNF and JNK pathway. TLR component, Cactus and activated form of JNK, p-JNK were induced in the tumor cells whereas Drosophila TNF ligand, Eiger was upregulated in the surrounding normal cells. We hypothesized that a crosstalk between these key pathways in the TME promotes tumor survival and progression. So we decided to study the genetic epistasis interaction between JNK and TNF pathways to assess the requirement and roles of these signals in the TME. Our preliminary data suggest specific and significant roles for the TNF and JNK pathways. We are currently testing if TLR, TNF and JNK pathway genetically regulate each other or independently affect the TME and growth of tumors. Our research will help unravel the correlation between inflammatory pathways and tumor progression in an in vivo model.

## **Increasing taxonomic and functional diversity are linked with temporal stability of aboveground biomass and coarse woody productivity in a subtropical Taiwan forest**

College of Arts and Sciences: Biology

Oral Presentation - Graduate Research

**PRESENTERS** Julia I Chapman

**ADDITIONAL AUTHORS** Jyh-Min Chiang

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** Kennedy Union 211, 11:00-11:20

The ability of an ecosystem to withstand perturbation without a major change in its function, also known as ecosystem stability, is hypothesized to increase with biodiversity. High levels of diversity can buffer an ecosystem against the impacts of species loss because the remaining species can compensate for any loss of function. We examined the relationship between both taxonomic and functional diversity and the stability of forest carbon storage (woody biomass production), which is an important ecosystem function due to its potential role in mitigating anthropogenic climate change. In a subtropical broadleaved forest in Taiwan, all woody stems were tagged, identified to species, and measured (diameter) across 625 quadrats in 2004, 2009, and 2014. Ecosystem stability was calculated as the coefficient of variation in aboveground biomass (CV AGB) and the change in coarse woody productivity (delta CWP). We tested for correlations between these stability metrics and species richness, Shannon diversity, functional richness, and function dispersion. Overall, we found that Shannon diversity and functional dispersion were more strongly correlated with ecosystem stability than richness metrics. The amount of woody biomass and its rate of production were more consistent through time in quadrats with higher Shannon diversity and functional dispersion, which suggests that the evenness, or relative abundance, of species and their functional traits is an important contributor to ecosystem stability along with the sheer number of species or trait types present. We also found that some soil characteristics, such as pH and nutrient availability, were linked with stability in a way that suggests resource-rich environments tend to be less stable in woody biomass production through time. These patterns are consistent with the diversity-stability hypothesis and indicate that soil conditions are an important factor, but further analyses are needed to understand how topography and typhoon disturbance may also interact with ecosystem stability.

## **The impact of the non-native invasive shrub *Lonicera maackii* on sensitive salamander populations in headwater streams**

College of Arts and Sciences: Biology

Oral Presentation - Honors Thesis

**PRESENTERS** Meg Eileen Maloney

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** Kennedy Union 311, 11:00-11:20

*Lonicera maackii* has dramatically shifted ecosystems across much of the Midwestern USA and has been linked to alterations in riparian zones along headwater streams. The foliage from *L.maackii* releases water-soluble photochemicals into the ecosystem that have adverse effects on insects, herbivores, and plants. Previous research has demonstrated that *L.maackii* has negative impact on the growth of several amphibian species; however, little is known about the impact on stream salamanders, which are most common in headwater streams. While qualitative assessments of stream salamanders are a common practice, estimation of population density remains a methodological challenge. Our research goals were to (1) invent a prototype device for quantification of salamander abundance in streams, (2) validate this prototype through field trials across seasons and habitat types, and (3) implement the developed technology to further understanding of salamander presence and abundance along an invasion gradient of *L. maackii*. We developed a new artificial habitat for sampling salamanders that allows for density calculations. Field trials revealed that this method was superior for estimating salamanders than other methods including the standard Visual Encounter Survey (VES) and allows for estimation of population density. This invention was used to assess stream salamander abundance and richness along a gradient of *L.maackii* invasion.

## **Investigating the synaptogenic effects of the rapid-acting drug ketamine in the female mouse hippocampus**

College of Arts and Sciences: Biology

Oral Presentation - Independent Research

**PRESENTERS** Emily Margaret Flaherty, Joey Edward Saurine, Connor F Thelen

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** Kennedy Union 311, 12:30-12:50

Major depressive disorder (MDD) is a debilitating neuropsychiatric disease and affects more than 350 million individuals worldwide. A phenotypic characteristic of MDD, the atrophy of dendritic spines, most often presents itself in brain regions implicated in stress response (e.g. prefrontal cortex and hippocampus). Directly combating these neural deficits, the rapid-acting antidepressant drug ketamine has been shown to induce its therapeutic effects by enhancing synaptogenesis and increases in dendritic spine density in the male rodent brain. Although the antidepressant efficacy of ketamine has been validated, the majority of research has been conducted almost exclusively in males. Published and preliminary data from our group and others suggest that female mice are behaviorally more reactive to the antidepressant-like effects of ketamine; however, the mechanisms responsible for the female sensitivity to ketamine are still not characterized. In the context of a Stander Undergraduate Fellowship a modified Golgi-Cox neurohistological staining technique was used to evaluate the temporal synaptogenic effects of a single dose of ketamine in the cornu ammonis 1 (CA1), CA3 and dentate gyrus (DG) hippocampal subfields of male and female mice. Overall, we found that single dose of ketamine (10 mg/kg) that induces both rapid and sustained antidepressant-like effects in both sexes of mice elicits time and sex-dependent synaptogenic effects in the different hippocampal subfields in male and female mice. These findings further support the premise that ketamine induces its antidepressant-like effects in a sex-specific manner and that the HIPP may play a critical role in mediating the antidepressant effects of ketamine in the female sex.

## **Growth Regulatory Pathway collaborates with Axial Patterning Genes to regulate Patterning and Growth in *Drosophila* Eye**

College of Arts and Sciences: Biology

Oral Presentation - Graduate Research

**PRESENTERS** Neha Gogia

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** Kennedy Union 312, 2:00-2:20

In all the multicellular organisms, organogenesis requires axial patterning to determine Antero-Posterior (AP), Dorso-Ventral (DV), Proximo-Distal (PD) axes. Any deviation in these axes during development leads to congenital birth defects. In our model system, *Drosophila melanogaster* (a.k.a fruit fly), Dorso-Ventral (DV) patterning marks first lineage restriction event. We have identified defective proventriculus (*dve*), an ortholog of SATB homeobox 1 (special AT-rich sequence binding protein 1), as a new member of DV patterning genes hierarchy. We have shown that *dve* acts downstream of *pannier* (*pnr*, a GATA-1 transcription factor), and upstream of *wingless* (*wg*) in dorsal gene hierarchy. Loss-of-function (LOF) of *dve* or *pnr* results in dramatic dorsal eye enlargements, whereas Gain-of-function (GOF) of *dve*, *pnr* suppresses eye specific fate. We have demonstrated that *Wingless* (*Wg*), (1) is downstream target of Hippo growth regulatory pathway (highly conserved) in eye, (2) acts downstream of *dve*, (3) exhibits similar eye enlargement and suppression phenotypes (upon LOF, GOF respectively), and has been shown to play a role in growth. Here, we present that, DV patterning genes interacts with Hippo signaling to regulate their common downstream target, *Wg* during developing *Drosophila* eye. Our data (using GOF, LOF) states that (1) These two unrelated pathways are related and interacts antagonistically, (2) Activating Hippo signaling suppresses *dve*, *pnr* expressing cells, downregulates *Wg* and changes head, antennae specific fate to an eye, (3) Blocking cell death activity of *hpo* (using *UAS-p35*, anti-apoptotic) doesn't affect its ability to undergo differentiation, (4) Growth regulatory pathway regulates the expression of DV patterning genes (*dve*, *pnr* acts downstream of Hippo pathway), and that (5) GOF/LOF of *dve*, *pnr* does not affect the expression of Hippo downstream reporters *diap1* and expanded in developing eye of *Drosophila*. These studies present new genetic interaction between two unrelated pathways to regulate growth and patterning of an organ.

## **Investigating the role of a novel calcium-handling protein in regulating locomotor and cognitive behavioral processes in mice**

College of Arts and Sciences: Biology

Oral Presentation - Independent Research

**PRESENTERS** Aikaterini Britzolaki, Emily Margaret Flaherty, Joey Edward Saurine, Connor F Thelen

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** Marianist Hall Learning Space 218, 2:00-2:20

Attention-deficit/hyperactivity disorder (ADHD) is an extremely prevalent and debilitating neurodevelopmental disorder that affects people of all ages. ADHD symptoms include persistent inattention, impulsivity and/or hyperactivity, accompanied by significant learning and memory deficits. Abnormal function of calcium-handling machinery has been implicated in the pathophysiology of ADHD in humans and in animal models. Exciting preliminary data from our group support that a protein which plays a major role in regulation of calcium homeostasis in the heart, is also expressed in a specific region of the brain that is implicated in the neurobiology of ADHD. Moreover, we have found that genetic ablation of this calcium-handling protein in mice (i.e., knockout, KO) results in the manifestation of a hyperactive ADHD-relevant behavioral phenotype. State-of-the-art mouse behavioral neuroscience techniques were performed to further dissect the hyperactive locomotor phenotype of KO mice, and to assess how loss of the calcium-handling protein's function impacts critical cognitive processes (i.e., object recognition memory, spatial memory and social memory). The results of the proposed studies have shed light on the complex functions of this novel calcium-handling player in the brain suggesting this calcium-handling protein is involved in locomotor and learning and memory processes of the brain.

## The Vascular Flora of Bill Yeck Park: Supporting the Conservation of Local Biodiversity

College of Arts and Sciences: Biology

Oral Presentation - Honors Thesis

**PRESENTERS** Taylor Marie Sparbanie

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** Kennedy Union 211, 2:30-2:50

Maintaining and fostering biodiversity is a critical component of natural areas management and conservation because of its known links to ecosystem function and stability. Identifying and documenting species through a floristic inventory is an important strategy for detecting the presence of rare or unique species, as well as invasive species that pose a threat to biodiversity. Bill Yeck Park is a 194-acre nature park maintained by Centerville-Washington Park District and is largely surrounded by residential areas. As urban green spaces like Bill Yeck Park become more and more prevalent and critically important for the provision of ecosystem services in a postmodern, industrialized, and developed world, knowledge of the composition and function of these nature parks become critically important to inform management. Our goal is to generate a list of vascular plant species for the park that can help the park's manager identify critical areas for conservation and better strategize removal of invasive species. Floristic surveys for this project began in March of 2017, and will continue into 2018. Currently, 245 species have been identified and documented across a variety of habitats, including meadows, riparian corridors, and upland forest.

## Regulation of dronc by the Hippo pathway

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Karishma Sanjay Gangwani, Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Hippo pathway is an evolutionarily conserved pathway that regulates organ size and tissue homeostasis in *Drosophila* and mammals. The pathway functions by regulating the nuclear availability of transcriptional cofactor Yorkie (Yki), mammalian YAP, which is regulated by the activity of a core kinase cascade comprising the serine threonine kinases Hippo (Hpo) and Warts (Wts) and their accessory proteins. Yki binds with transcription factors like Scalloped (Sd) or Homothorax (Hth) to regulate target genes involved in cell proliferation and survival. Downregulation of the Hpo pathway causes increased cell proliferation and overgrowth, whereas hyperactivation of this pathway leads to cell death due to activation of these caspases. Previous work in our lab identified the initiator caspase Dronc (mammalian Caspase 9) as a transcriptional target of Yki. Caspase proteins are cysteine aspartic proteases which play essential roles in cellular signaling, development and cell death via apoptosis or Programmed Cell Death (PCD). We found that loss of Hippo signaling leads to downregulation of dronc expression suggesting that Yki could act in co-repressor complexes to provide growth and survival cues to cells where Hippo pathway is downregulated. We hypothesize that Yki functions both as an activator and a repressor simultaneously in association with the TEAD family transcriptional factor Sd to control dronc expression. Here, we present our work on the regulation of dronc by the Hippo pathway, and its implications in organ size control, and in disease conditions like cancer.

## Monitoring fecal coliform bacteria concentrations for the assessment of recreational safety of kayak chutes in Great Miami River near downtown, Dayton, OH.

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Audrey Allison Hayes, Suzanne L Lowes

**ADVISORS** Jeffrey L Kavanaugh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

To determine the potential risks to human health of newly-developed recreational kayak chutes in the downtown Dayton, OH area, surface water samples were collected from sites in the Great Miami River, Mad River, Wolf Creek, and Rubicon Creek. Samples were collected directly from the main river channel adjacent to the kayak chutes and from local stormwater outfalls that empty into rivers and streams near the kayak chutes. Surface water samples were put on ice and taken to the lab where they were cultured in an incubator and counts were made of fecal coliform colonies. Colony concentrations for total fecal coliforms and *E. coli* regularly exceeded the Ohio EPA's class A standards for recreational waters. It was found that concentrations increased as the water level increased due to heavy precipitation. Future directions include determining the source of the *E. coli* contamination in the Rubicon Creek outfall, which may reveal the University of Dayton's impact on coliform bacteria concentrations since this is the campus's main outfall into the Great Miami River. We also plan to collect samples from kayak chutes outside of the Great Miami River.

## Sex differences in the antidepressant-like effects of ketamine in an inflammatory mouse model of depression

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Nick Richard Halloy, Benjamin Klocke, Connor F Thelen



**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

A major discovery in the treatment of major depression was the finding that a single sub-anesthetic dose of ketamine induces both acute and sustained antidepressant effects in patients. Although women report major depression at twice the rate of men, the vast majority of research on ketamine's antidepressant effects has been focused on the male sex. By inducing neuroinflammation in rodents using the pro-inflammatory agent lipopolysaccharide (LPS), a sickness syndrome is manifested with many behavioral and physiological manifestations that overlap with the clinical symptoms of major depression. The majority of studies investigating the neurobiological effects of LPS have been conducted in the male sex. The antidepressant-like effects of ketamine have only been documented in male LPS-exposed mice. Of note, female responsiveness to ketamine in this neuroinflammatory model of depression remains elusive. In this study, we are investigating the sex differentiated antidepressant effects of both acute and chronic treatment of ketamine on the LPS-induced neuroinflammatory model of depression. Preliminary data from acute ketamine treatment points to a differentiation in behavior in male and female mice. In addition to this preliminary data, we are currently conducting the chronic ketamine administration phase of the study. Data collected by our lab is promising in the search for novel mechanisms for female ketamine response under the neuroinflammatory model of depression.

## Effect of tyrosine kinase inhibitors on *Drosophila* glioma model

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Kaitlyn M Alleman, Oscar Antonio Barnes Valdejuely, Dudley Kiefer Campbell, Claire Marie Feller, Karishma Sanjay Gangwani, Michael Moran Gilbert, Katie Katherine Parker, Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Glioma are glia-derived primary brain tumors with very poor prognosis. The standard of care is surgery followed by radio- and chemo/immuno-therapy, or combinations thereof, however, all patients with glioma ultimately die. Thus, there is a need to test if recently approved drugs can inhibit the growth and progression of this tumor. We have developed a *Drosophila* glioma model based on the two genetic/ oncogenic pathways known to be most frequently activated in patients viz., the Ras/MAPK pathway and the PI3K pathway. Inhibitors of these two pathways do not help to limit the progression of glioma. Therefore, it is thought that other oncogenic pathways induce glioma growth and progression. We designed a chemical screen involving drugs targeting Tyrosine kinases (Selleck Biochem Chemical library) – key enzymes that are activated by oncogenic pathways. The chemical screen involves feeding glioma containing larvae 10uM and 300uM drugs from the library at early third instar stage, then allow these larvae to grow and mature to the third instar stage (120h of development), and then dissect the brain to study effects on glioma growth and track survival on days 5-7 when other glioma positive larvae die. Here, we present our progress from this screen focusing on chemicals A2-A11.

## The Effects of Tsetse Fly Beta 2 Tubulin on the Fruit Fly Axoneme

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Elizabeth Marie Kramer

**ADVISORS** Mark G Nielsen

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

There are constraints on the evolutionary process. A big question is how nature can generate alternate forms of a protein without interfering with its function. The beta tubulin protein of the fruit fly spermtail is an example of a protein that has not evolved for millions of years. The ultimate goal of this research is to determine how it evolves when it does. To do this, we need to first determine if beta tubulin tolerates change by testing the ability of a related but different beta tubulin to support the fruit fly sperm tail. In this case, the goal is to determine if *Glossina morsitans* (tsetse fly) beta 2, which is 14 amino acids different, can replace *Drosophila* beta 2 and generate motile sperm. Using genetic techniques we have expressed tsetse fly beta 2 in the fruit fly *Drosophila melanogaster*. We now need to selectively mate fruit flies to generate a fly that is a homozygote for both tsetse fly B2 and the null mutation for fruit fly B2. These flies will then be tested for fertility, TEM cross sections will be taken of the testis, and the testis morphology will be analyzed. If the resulting fruit flies are infertile with immotile sperm, then it is likely that the beta protein co-evolved with another component of the sperm tail. Having to wait for a second protein to evolve would slow the evolutionary process and explain why beta 2 has not evolved for 60 million years. But if the resulting fruit flies are fertile, then evolution took a very narrow path that maintained *D. melanogaster* beta 2 function in the face of 14 amino acid changes.

## Extracellular biofilm polysaccharides-mediated antibiotic resistance of *Pseudomonas aeruginosa*

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Celeste Claire Bergman

**ADVISORS** Yasuhiko Irie

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

High density surface-attached growth of bacteria are called biofilms. This bacterial community secrete extracellular matrix materials, of which the major components are polysaccharides. The polysaccharides serve as adhesion molecules as well as a protective barrier against antibiotics and other antimicrobial compounds. *Pseudomonas aeruginosa* is an opportunistic pathogen, and its propensity to grow biofilms in infected sites causes serious medical problems, often untreatable due to their antibiotic resistance properties. The two major biofilm polysaccharides of *P. aeruginosa* are the PEL and PSL polysaccharides. In this project, we show the relationships between antibiotic resistance and PEL/PSL polysaccharides of *P. aeruginosa* biofilms.

### **The Effects of Short Chain Fatty Acids on the Ability of *Listeria monocytogenes* to Form Biofilm**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Jake Edward Thomas

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Introduction. *Listeria monocytogenes* is a common food borne pathogen that can be fatal to those who with compromised immune systems. To combat food borne pathogens, short chain fatty acids are added as food to preservatives. Purpose. The purpose of this experiment was to determine the effects of short chain fatty acids (SCFAs) on the growth of *Listeria monocytogenes*. Specifically, this research looked at the impact of varying amounts of acetate, butyrate, and propionate on the ability of *Listeria* to grow in a biofilm, both aerobically and anaerobically, in polypropylene (PP) and polystyrene (PS) in microwell plates. Results. Under anaerobic, but not aerobic, conditions, *Listeria* planktonic growth increased when SCFAs were added in the culture medium. However, I did not detect consistent results when *Listeria* was growing in the microwell plates. Conclusion. As indicated by these results, *Listeria monocytogenes* planktonic growth can be increased when grown anaerobically with SCFAs. However, future research is necessary to assess the effects of SCFAs on biofilm growth.

### **Novel Zinc containing Porphyrin exhibits dark toxicity against an opportunistic pathogenic bacterium grown under planktonic and biofilm conditions**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Nehaben Nik Patel

**ADVISORS** Kristen Krupa Comfort, Jayne B Robinson, Shawn M Swavey

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

One of the greatest threats to human health, and life, is the rise of antibiotic resistant bacterial infections. National summary data from the CDC estimates that at least 2,049,442 million illnesses and 23,000 deaths occur each year as the result of antibiotic resistant bacteria and fungi. Additionally, 250,000 illnesses and 14,000 deaths are caused by the bacterium *Clostridium difficile*, considered to be related to antibiotic resistance and use. We are the co-inventors of two patented novel technologies for the treatment of antibiotic resistant bacteria. Both treatments make use of a novel porphyrin ZnP (US Patent # 9,364,537) that does not require using traditional photo-activation i.e., it exhibits unique dark toxicity. In standard tests against planktonic cells ZnP exhibits broad spectrum activity, for example it is bactericidal towards: *Pseudomonas aeruginosa* (MIC<sub>90</sub> at 25µM), MSSA and MRSA strains of *Staphylococcus aureus*, as well as *Listeria monocytogenes* and *Mycobacterium smegmatis*. In toxicity testing using lung alveolar cells no toxicity was detected at concentrations that were 2-fold higher than the MIC. We have demonstrated that *P. aeruginosa* (PAO1) cells take up ZnP rapidly and accumulate it inside the cell. In cells treated with 25 µM ZnP there was a substantial loss of chromosomal DNA after as little as 5h; with an almost total loss at 50 µM. Additionally, we have tested various uptake/transport systems in PAO1 that aid in uptake of ZnP. In biofilm experiments, ZnP was able to disrupt 16h preformed biofilms on Polyethylene (PE) and stainless steel surfaces by 2 logs and, more interestingly, prevent the formation of biofilms when PE surface was pretreated with 25µM ZnP compared to the control.

### **The role and evolution of the Dopa decarboxylase gene in the origin of a derived dimorphic fruit fly pigmentation trait**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Sumant Grover, Becca Jo Kaiser

**ADVISORS** Melissa E Williams, Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Understanding the genetic and molecular underpinnings for trait diversity remains a central goal of evo-devo research. Traits arise by the orchestrated expression of numerous genes in a gene regulatory network. Remaining poorly understood is how these networks and their expression patterns are initially assembled and subsequently diversify. Gene expression is controlled by DNA sequences known as cis-regulatory elements (CREs) that possess binding sites for transcription factors whose binding drives a specific pattern of expression. It is anticipated that gene expression evolution often occurs through the formation, modification, and destruction of CREs, presumably by changes that create or destroy binding sites for transcription factors. However, the binding site

level of CRE evolution has been worked out in few cases. The fruit fly species *Drosophila melanogaster* has a male-specific pattern of abdominal pigmentation for which the enzyme encoding genes and several of their expression-regulating transcription factors are known. However, the details of how these regulators interact with CREs remain largely uncharacterized, including the Dopa decarboxylase (*Ddc*) pigmentation enzyme gene. Here we share the results of our efforts to uncover the CRE-basis of this gene's expression pattern, and how this regulation and pattern of expression evolved during the origin of this male-specific trait.

## The Survival Rate of *Listeria* in Dairy Products Compared to Pathogenic *E. coli*

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Megan Ashley Marasco

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

*Listeria monocytogenes* is a deadly human pathogen frequently found in dairy products. Its ability to grow and survive in the cold contributes to frequent contaminations despite the presence of food preservatives, such as propionate. In my research, I first studied how effective propionate is against *Listeria* in dairy products, including three types of milk, 2%, fat free, and chocolate, all with and without propionate. Then I compared the survival of *Listeria* to survival of pathogenic *E. coli* in propionate-supplemented milk by monitoring the number of surviving bacteria 1, 2, and 3 days after storage in the refrigerator. I found that propionate is effective against *Listeria* only in 2% milk and is effective against *E. coli* only in fat free milk. Therefore, the efficacy of propionate depends on the types of dairy products as well as the types of foodborne pathogens. When one is developing food preservation methods, it is important to consider the different types of food and foodborne pathogens.

## Compartmentalization and Temporal Distribution of L-DOPA-Containing Proteins Involved in Oyster Shell Formation

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Benjamin Nicholas Schmeusser

**ADVISORS** Douglas C Hansen, Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Marine molluscs, such as *Crassostrea virginica* (eastern oyster), produce structural proteins that are essential in adhesive strategies and shell biomineralization. The unique properties of these proteins derive from the amino acid composition. L-3,4-dihydroxyphenylalanine (L-dopa), which is a unique key amino acid in the cross-linking of these proteins, can be considered a biomarker for identification and localization of shell formation proteins. The focus of this research was to determine the compartmentalization of L-dopa-containing proteins involved in the process of biomineralization in *C. virginica* at different time points during a shell repair event. Three organismal compartments were identified as possible locations of L-dopa precursor proteins: hemocytes, cell-free hemolymph, and mantle tissue. Hemolymph was harvested from the adductor muscle of notched oysters and hemocytes were subsequently collected via hemolymph centrifugation. Mantle tissue was collected from specific locations. The product of repair, nascent shell deposited in the notch, was collected at discrete time points post-notching. Amino acid composition related to time since notching was determined via anion exchange HPLC with pulsed amperometric detection. Additionally, the Arnow Assay (specific for catechols) was used to stain for L-dopa in the samples. Preliminary data reveal increased L-dopa concentrations in hemocytes and hemolymph at 24-48 hours and 96 hours post notching, respectively, indicating a mobilization of resources for shell repair. These data support the hypothesis that L-dopa-containing proteins are involved in oyster shell formation and that they are distributed at discrete locations within the organism.

## Molecular Modeling and Characterization of a Mussel Adhesive Protein (MeFP-5)

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Kathryn Rose Zimlich

**ADVISORS** Douglas C Hansen, Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The blue mussel, *Mytilus edulis*, secretes adhesive proteins to facilitate adhesion to a variety of substrates. Several *Mytilus edulis* foot proteins (MeFP) have been isolated and characterized. MeFP-5 is said to be the most adhesive of these proteins, and has a comparatively large molecular percentage of L-Dopa when examined against MeFP proteins 1-4 at over 25% L-Dopa, if full conversion from tyrosine occurs. The catechol functional group of L-Dopa complexes with  $Fe^{3+}$  to form organometallic linkages, but how L-Dopa in MeFP-5 is interacting with an iron oxide surface, and if the lysine amino acids adjacent to L-Dopa help to facilitate formation of the epoxy-like barrier on iron oxides, is unknown. This project focuses on evaluating the orientation of the catechol groups in L-Dopa through molecular modeling, generating a 3D model of an iron oxide surface, characterizing regions of MeFP-5 which are most likely to complex with  $Fe^{3+}$ , and altering the amino acid composition of MeFP-5 to attempt to maximize adhesive properties and explore possibilities for creating a synthetic analog. Modeling is done in the programs ChemDraw® and Chem3D® (PerkinElmer) to analyze protein structure and the catechol positioning of L-Dopa within the protein MeFP-5. To validate and refine the model, experimental data of MeFP-5 adsorbed onto HY80 steel using Raman infrared spectroscopy have been used to

determine what interaction the lysine and L-Dopa functional groups in MeFP-5 have on the steel surface. These data have been incorporated into the 3-dimensional model of the protein-metal interface.

### **Synthetic aptamers as potential novel efflux pump inhibitors of the TolC channel in E. coli strains.**

College of Arts and Sciences: Chemistry

Poster - Graduate Research

**PRESENTERS** Venicia Alhawach

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Antibiotic resistance is more than ever one of the most contemporary challenges threatening the health system worldwide. According to World Health Organization, previous cases of bacterial infections - once treatable with antibiotics - can now be lethal due to the uncontrolled misuse of these agents. The emergence of resistance to antibiotics and the dearth of novel drugs currently under development urge the need to search for new effective antibacterials. One of the main triggers of bacterial resistance is the over-expression of multi-drug resistant (MDR) efflux pumps. These pumps allow the bacterium to pump antibiotics out of the cell and therefore desensitizes the cells to the antibacterial inhibitory effect. In this project, we propose to design small chains of nucleic acids called aptamers to bind to and block the outer membrane channel of the efflux pump, which is a protein called TolC, as one effective way to impede antibiotic resistant bacteria from effluxing antibiotics. To generate the DNA aptamers exhibiting a binding specificity to E. coli cells, the method of a whole-cell Systemic Evolution of Ligands by Exponential Enrichment (SELEX) was applied to a random single-stranded DNA library. Whether these aptamers were able to impede the efflux activity of the E. coli pump was then evaluated using an in-vivo efflux assay.

### **The Impact of the 515nm Effect on Singlet Oxygen Quenching in Photosynthesis: Model System Studies Using Beta –Carotene–Acid Complexes**

College of Arts and Sciences: Chemistry

Poster - Honors Thesis

**PRESENTERS** Lauren Arlene Hoody, Caoqinglong Huang, Ashlee Elizabeth Wertz

**ADVISORS** Mark B Masthay

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Beta-carotene is an orange biological pigment present in green plants, where it plays a protective role against the potential harmful effects of light. beta-carotene does this by deactivating "singlet oxygen", which is a toxic molecule generated during photosynthesis. During photosynthesis, beta-carotene temporarily converts from its native orange state to a pink state. We hypothesized that pink beta-carotene reacts with singlet oxygen less efficiently than native orange beta-carotene. To test this hypothesis, we chemically modeled beta-carotene's pink state with blue beta-carotene–acid complexes, which are chemically similar to pink beta-carotene, created by reacting beta-carotene with trichloroacetic acid (TCA). beta-carotene's efficiency at deactivating singlet oxygen was characterized by measuring the rate of degradation of 1,3-diphenylisobenzofuran (DPBF), which has a high reactivity towards singlet oxygen and is used to detect the amount of singlet oxygen in a solution. Our DPBF–based results to date indicate that native orange beta-carotene and blue beta-carotene–TCA complexes quench singlet oxygen with roughly equal efficiency. In future studies, we intend to confirm our DPBF–based results by monitoring the impact of beta-carotene and beta-carotene–TCA complexes on the 1270 nm (near–infrared) emission of singlet oxygen using a state–of–the–art, time–resolved near–infrared spectrometer; the UD Chemistry Department hopes to purchase this instrument in the near future. The results from this research could facilitate the development of solar energy devices with greater long-term stability.

### **The Impact of External Stimuli on the Molecular Trajectory of Micelles Residing at the Stability Boundary**

College of Arts and Sciences: Chemistry

Poster - Course Project, 201810 CHM 304L 01

**PRESENTERS** Joshua Killian, Jiayi Xie

**ADVISORS** Yoon S Lee

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Self-assembly is the potential key to understanding how we can build useful chemical and biochemical systems from individual molecules up to macro structures. The modification of the makeup of a micellar solution and observation of some of the physical and chemical properties of the solution was the goal and purpose of this research. Specifically, the purpose was to determine the molecular trajectory of the formation of the micelles in solution and to attempt to explain different kinetic and thermodynamic pathways. This research explored the nature of surfactant micellar solutions that contained a headgroup of ammonium with a chloride counter-ion in three different tail-group compositions. The three solutions were cetyltrimethylammonium chloride, tetradecyltrimethylammonium chloride, and dodecyltrimethylammonium chloride. The solutions were modified by the addition of various species, most significantly, decyl alcohol, tetraethylorthosilicate, and benzene. They were subject to heating, cooling, and shaking to form different micelles. The solutions were tested by various methods, including IR runs and particle size analysis, of the clear,

shaken cloudy, and temperature manipulated cloudy states. The results of this research showed that there were two pathways of micellar composition, a kinetic and a thermodynamic pathway. Future research could involve the further modifying the makeup of different micellar solutions by the addition of different types of alcohols, aromatic compounds, or silicate groups to determine if these trends are consistent across different micelle formations.

### The Impact of Benzene as a Chaotropic Agent in Surfactant Based Multicomponent Self-Assembling Systems

College of Arts and Sciences: Chemistry

Poster - Course Project, 201810 CHM 304L 01

**PRESENTERS** Sean Ernest Cedeno, Kasia Maria Solomianko

**ADVISORS** Yoon S Lee

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Self-assembly is a fascinating field that provides endless possibilities for chemical manipulation. This experiment investigates what effect benzene has during the self-assembly of micelles in various carbon chain solutions. Upon omission of delivering benzene from the solution, the system displayed the formation of an irreversible liquid crystal relatively quickly. IR spectroscopy was performed on one solution with benzene and one solution without benzene to try to understand what kind of role benzene plays within the system. Upon examination of the IR spectra, there was a clear difference in IR peaks. It was theorized that benzene has some sort of interaction with the tetraethyl orthosilicate (TEOS) that allows the system to form micelles that can reverse when left alone. Future experiments may include investigating the effect of water on the system as well as the effect of stirring on the system.

### A New Method in Organophosphate Synthesis

College of Arts and Sciences: Chemistry

Poster - Independent Research

**PRESENTERS** Emily Kathryn Granger, Kasia Maria Solomianko

**ADVISORS** Jeremy M Erb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

A variety of nucleophilic and Lewis acid catalysts were examined for use in promoting the synthesis of organophosphate triesters. All 8 organophosphate triesters are new compounds, reported here for the first time.  $MgSO_4$  was discovered as an inexpensive catalyst capable of improving the synthesis of a variety of aryl organophosphate triesters from the readily available and low cost precursor phosphorus oxychloride in a three-step, two-pot sequence. Yields for this method improve upon the uncatalyzed method by 8-36%. Although several chiral catalysts were tested, none were able to induce enantioselectivity in the reaction.

### The Entropic Tsallis Q Factor as a Measure of Distance from Thermal Equilibrium in Paramagnetic Spin Lattices

College of Arts and Sciences: Chemistry

Oral Presentation - Honors Thesis

**PRESENTERS** Charles Alan Benton

**ADVISORS** Mark B Masthay

**LOCATION, TIME** Kennedy Union 211, 1:30-1:50

The principle objective of the proposed research is to use the Tsallis entropy factor  $q$  to specify the proximity of a system to thermal equilibrium. Morespecifically, we will look at how different combinations of energy states affect  $q$  in two-level paramagnetic spin lattices (PSLs; regular lattices with spinsites) that are placed in an external magnetic fields. The spins in spin- $1/2$  PSLs align either parallel (the low energy level) or antiparallel (the high energy level) to the external magnetic field, thus making them two-level systems. The overall system under investigation is a collective super-PSL (A+B) comprised of two sub-PSLs (A and B). Two conditions are explored: (1) the canonical case in which a super-PSL at constant temperature exchanges energy with a heat bath; and (2) the microcanonical case in which the super-PSL is energetically isolated, and hence at constant energy.

### Efflux Pump Inhibition in Multiple Antibiotic Resistant Bacteria

College of Arts and Sciences: Chemistry

Poster - Honors Thesis

**PRESENTERS** C.J. Roger Moellering

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Over the past few decades, bacteria have become resistant to multiple antibiotics due to humans misusing and overusing antibiotics. Over-expression of bacterial efflux pumps has been identified as a key player in bacterial drug resistance. Over-expression of these pumps essentially allows bacteria to transport antibiotics from their intracellular space to their extracellular space before the antibiotics can effectively act on the organisms. To combat multiple drug resistance in bacteria, this research aimed to find natural, plant-derived inhibitors of an efflux pump in *E. coli* called the AcrAB-TolC pump. Cinnamon, cranberry, pumpkin seeds, thyme, black

tea, and oolong tea were chosen for testing for inhibition of this pump. These items were ground, dried, and put in an extractor to isolate polar compounds which were eventually introduced into a bacterial fluorescence assay. Ultimately, the oolong tea was the only extract tested that led to a positive fluorescence reading, reflecting potential inhibition of the AcrAB-TolC pump. Isolation and purification of the active compound within oolong tea still an ongoing area of investigation.

## Combating Antibiotic Resistance in Multidrug Resistant Bacterial Cells using Plant Derived Inhibitory Compounds

College of Arts and Sciences: Chemistry

Poster - Independent Research

**PRESENTERS** Emily Marie Jones

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Bacteria have steadily developed defenses against antibiotics since the world's first fleet of antibacterial drugs was introduced. One strategy that bacteria can use to become multi-drug resistant involves the use of large, membrane-embedded efflux pumps, such as the AcrAB-TolC pump found in *Escherichia coli* (*E. coli*) and other Gram-negative bacteria cells. The most antibiotic-resistant cells are those which over-express the genes that code for this large efflux pump, and this gives the bacterium the capability of transporting a wide variety of compounds out of the cell, including antibiotics that we use to combat bacterial infections. The overexpression of these bacterial efflux pumps renders our antibiotics ineffective. To combat this antibiotic-resistance strategy, I will be analyzing plant extracts to identify new compounds that can block the activity of bacterial efflux pumps and restore the effectiveness of existing antibiotics. Fourteen roots, shoots, fruits, seeds, and leaves will be tested using a fluorescence-based efflux assay and any extracts that show inhibitory activity will be analyzed so that the active compound can be identified. This research could open up a new avenue in the treatment of multi-drug resistant bacterial infections.

## Methods of Blocking Efflux Pump Activity in *Escherichia Coli*

College of Arts and Sciences: Chemistry

Poster - Graduate Research

**PRESENTERS** Erich Nicholaus Auer

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Overuse of antibiotics throughout the developed world has contributed significantly to the emergence of antibiotic-resistance in bacteria. Although this helps bacteria it is extremely harmful to humans. As bacteria adapt to the antibiotics, current treatments become ineffective and bacterial infections can become life threatening. One of the mechanisms that bacteria, such as *E. Coli*, use are efflux pumps. Efflux pumps are capable of taking potentially harmful substances, like antibiotics, from inside the bacterial cell and moving them out. This allows the bacterium to escape from the killing effects of the antibiotics. My hypothesis was that a natural product, small molecule compound, or DNA aptamer would be able to bind to some part of the tri-part structure of the efflux pump and block its activity. The results showed that there are some promising compounds but none that were actually capable of blocking activity to a significant degree.

## Unrecognized and Underwritten: The History of the Black Press

College of Arts and Sciences: Communication

Poster - Course Project, 201780 CMM 439 01

**PRESENTERS** Jada Monique Woods

**ADVISORS** Chad E Painter

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The black press was born out of a need and that need is still pertinent today. Before 1827, black people largely did not exist in the media. There were only two options for the black community stay silent and keep their marginalized voices to themselves or start voicing those opinions and advocating for rights by creating a newspaper. After 1827, black newspapers in the North developed into the main medium of expression and primary community service outlet for black people. The researcher examined the history of black media from the mid-1800s to 2017. Evidence from black newspapers and publications throughout history shows every success against oppression and inequality has come with a price for black press in the United States. In 2017, blacks have more opportunities because of those publishers whose goal was to elevate and educate blacks. Currently, blacks have improved the second-class citizen status in some respects, but clear inequalities still persist. Although mainstream news organizations have made efforts to represent blacks more, there are still large disparities. The black media is still essential for the well-being of the black community. The black press began as an outlet to acknowledge the black community and push for equality and this kind of activism is still needed today.

## Public Memory: The Monuments and Memorials of UD

College of Arts and Sciences: Communication

Poster - Course Project, 201810 SSC 200 31

**PRESENTERS** Jen Mayrena Agudelo, Essa Alhamer, Lillian Margaret Dickman, Andrew Patrick Gross, John Martin Harmon, Brandon

Michael Heath, Leah S Henkel, Seth Christian Hill, Kristen Hisek, Mitchell Christopher Honious, Tyler Andrew Johnson, Trent E Jones, Kelly Ann Katis, Kristine Anne Kearney, Liza Christine Lutz, Taylour W McMullen, Katie Katherine Parker, Matthew John Pins, Ryan Darnell Scott, Cassandra L Secrease, Micheal John Sheridan, Sophia Jane Tokar, Marcel J Tworek, Ying Wang, Adam Steven Wicks, Joseph J Wilson

**ADVISORS** Cassandra L Secrease

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Public Memory themed section of SSC200 was tasked with proposing monuments and/or memorials needed on campus at The University of Dayton. Five groups of five students each conducted survey, observational, and archival research to choose subjects connected to the UD culture and deemed worthy of commemoration. Through careful consideration of concerns related to public memory, identity, culture, and materiality, each group created and designed either a monument or memorial fitting the memory of their chosen subject. Groups will be able to explain their designs, rationale, and processes culminating in their final Course Project for SSC200.

## **Cards Against Incivility: Play the Beta Version of the Game**

College of Arts and Sciences: Communication

Panel Discussion - Course Project, 201810 CMM 100 H2

**PRESENTERS** Ian James Beach, Nathan A Brelage, Rachel Elizabeth Carr, John Currie Dickson, Bridget Anne Fallon, Luke F Flottman, Courtney G Harbert, Indigo Emma Hudepohl, Susanne Jacobsen, Sean Wesley Kapp, Julia Karlsson, Adam Gregory Kaye, Joshua Edward Kinser, Ean Cole Kuska, Bo A Leszcynski, Kylie E Moellering, Paul C Mossing, Jenna Mary Perdue, Katherine A Perille, Cara M Rasmussen, Emily Viktoria Sandstrom, Cassandra L Secrease

**ADVISORS** Cassandra L Secrease

**LOCATION, TIME** Kennedy Union Torch Lounge, 10:30-11:30

We have all heard of the popular game with a similar name but Cards Against Incivility (CAI) is the game you play to increase your understanding of civility. Players of CAI choose, explain, and defend, as needed, a variety of responses to common and perhaps some not-so-common communication situations. Has anyone ever gone on a political rant at your Thanksgiving dinner? Have you ever returned to your dorm room only to find your roommate practicing their air-guitar routine? Ever experience speechlessness when someone makes an offense joke? CAI will help you consider possible reactions to such situations and many, many more!

## **Epicenter: Dayton's Opioid Crisis**

College of Arts and Sciences: Communication

Visual Arts Exhibition - Course Project, 201810 CMM 499 01

**PRESENTERS** Taylor Lee Alexander, John Francis Antonini, Grace E Barry, Patrick James Bernauer, Tom E Cook, Alexandra C Damiani, William E Delaney, Matthew Aidan Hilliard, Gregory R Kennedy, Molly Erin Moesner, Alexander A Moulvi, Florian Andreas Rieger, Cody Mitchell Rose, Maggie Ann Scully, Phoebe Marie Trogolo

**ADVISORS** Gregory R Kennedy

**LOCATION, TIME** Science Center 114 - Auditorium, 11:00-11:40

It's no secret that the heroin epidemic is a nationwide problem, but it seems to have impacted Ohio, especially Dayton, disproportionately. Media Production students at the University of Dayton are creating a documentary that educates and enlightens people as to the reality of living in the epicenter. After examining and presenting a scope and history of the problem, we are concentrating specifically on addiction as a disease, not a choice. During the course of our research, we have determined that most addicts do not use drugs to get high - they use them to avoid feeling sick due to their chemical and physical dependency. We have interviewed former addicts, treatment specialists, coroners and law enforcement officers for a comprehensive analysis of a problem that has existed for decades and likely will continue for many more. Presenting several points of view in the hopes of sharing how opioid addiction impacts different people, our documentary examines what different demographics of people believe could be the solution to mitigating an ongoing crisis. Our documentary is a call to action for the community at large, and we want to break the stigma of addiction. Whether you are married to an addict, lost a parent to addiction, or are a politician capable of spurring change, addiction does not discriminate.

## **Call to action to health communication scholars: Addressing the adolescent STD epidemic through research in developmental triggers for sexual health information seeking behaviors (HISB)**

College of Arts and Sciences: Communication

Oral Presentation - Graduate Research

**PRESENTERS** Laura Combs

**ADVISORS** Angeline L Sangalang, Teri L Thompson

**LOCATION, TIME** Kennedy Union 207, 12:00-12:20

2016 marked the highest numbers of sexually transmitted infections ever recorded in the U.S. for chlamydia, gonorrhea and syphilis. Adolescents ages fifteen to twenty-four are diagnosed with half of all new transmissions of STDs and one in four sexually active females in this age range is infected with an STD. The CDC has identified this alarming transmission rate as an "epidemic accelerating

in multiple populations” and one which requires a “renewed commitment from all players [state and local health departments, providers, general population]” (CDC, 2017). Health campaign designers need reliable, theory-based research developed on their target populations to create effective health messages; however research studies don't often recognize that some populations, such as adolescents, have unique needs which may require different communication strategies during different stages of their development. Recent research in HISB have shown that social determinants such as age, gender, race, education, health literacy, and financial status do influence an individual's access and use of information channels as well as her or his interest and capacity for processing that information (Galarce, Ramanadhan, & Viswanath, 2011); however no research specifically studying adolescent HISB has been published by health communication scholars. This project serves as a call to action to health communication scholars to make a more systematic study of adolescent populations and their sexual health HISB patterns. This project starts the conversation by suggesting a theory-based approach for anticipating developmental triggers for sexual health HISB which may change throughout the different development stages of adolescence. Understanding how, where, and at what age young people seek sexual health information can improve the effectiveness of sexual health campaigns aimed at this important age group.

## **Engaging Millennials & Generation Z in Cybersecurity: How to Train a Cyber-Mindful™ Workforce**

College of Arts and Sciences: Communication

Oral Presentation - Independent Research

**PRESENTERS** James D Robinson, Thomas D Skill, Abby Papenfus

**LOCATION, TIME** Kennedy Union 312, 12:00-12:20

With their unique values, workplace traits, and technology-use habits, Millennials and “Gen Z'ers” are expected to dramatically impact organizations as they become the most dominant generations in the workforce. As digital natives who are always connected to their devices, these generations pose new challenges for corporate cybersecurity. This presentation will highlight the attitudes and behaviors of Millennials and Generation Z'ers regarding technology, privacy, and cybersecurity. It will also discuss the Center for Cybersecurity & Data Intelligence's preliminary research on generational differences within UD's “Cyber-Mindfulness™” engagement methodology. The researchers constructed an online questionnaire that surveyed a convenience sample of 402 college students and 47 high school seniors. They created four indexes that compared Millennials and Gen Z on cybersecurity issues. This presentation will highlight the survey's results, exploring implications and practical applications of the research.

## **Social Support for LGB College Students**

College of Arts and Sciences: Communication

Oral Presentation - Course Project, 201780 COM 562 02

**PRESENTERS** Irina Enevska, Karen Mikaela Lucashu Ryner

**ADVISORS** Angeline L Sangalang

**LOCATION, TIME** Kennedy Union 207, 12:30-12:50

Considering the growing mental and physical health problems faced by lesbian, gay, and bisexual individuals in the United States, universities should implement more methods to help students overcome their difficulties. The paper focuses specifically on Ally Training, a free program offered by the University of Dayton, available to students, staff, and faculty. The training is designed to educate individuals on how to better support lesbian, gay, bisexual, transgender and queer individuals (the LGBTQ+ community).The present paper will discuss the mental and physical health problems associated with lesbian, gay and bisexual individuals' lack of emotional and social support. It examines the Transtheoretical Model, which provides insight on to how to encourage students to attend training. Finally, it discusses the need for creating an effective health campaign and spreading awareness.Keywords: lgbtq+, college students, transtheoretical model, emotional support, social support, mental health

## **Dental Health Beliefs of Chinese College Student based on the Health Belief Model**

College of Arts and Sciences: Communication

Poster - Graduate Research

**PRESENTERS** Peijun Hou

**ADVISORS** Angeline L Sangalang

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Dental health problem is a serious and underexplored topic in China. This study used Health Belief Model to investigate the health belief of dental health promotion behavior among Chinese college students at University of Dayton. The results indicated that laziness is the biggest barrier for daily brushing behavior, while most of them also lack knowledge about flossing. The barriers to annual dental check-ups include expensive cost and disregarding the importance of oral health. The study also examined the preference of information seeking and scanning channel about dental health-related information. Most respondents come across information about health-related knowledge through social media and mass media, though they prefer to search such information through dentist and social media. Most participants think their dental health-related knowledge is moderate. One the most interesting findings is about self-efficacy, as most of Chinese students answered they have no idea when they were asked self-efficacy related questions such as “What can improve someone's confidence on flossing daily?”. Consider the concept “self-efficacy” was built under Western culture and society, even though self-efficacy has been shown to be a strong predictor of performance with Western populations,



whether self-efficacy can predict performance with non-Western populations is still not clear.

### **Ethic Issues in Journalism: Reporting Truth while Respecting Privacy**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Elizabeth Grace Elward, Mari Margaret Fazio

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Mari Fazio looks at how the press covers private individuals who have been thrust into the public limelight through, for example, natural disasters. Fazio addresses how journalists can report the news and still respect people's privacy. Elizabeth Elward considers the long-standing debate in journalism on when, if ever, the press should identify victims of sexual assault. Elward explores the ethical issues involved, especially in light of today's openness, and what might be the best course of action today.

### **Ethic Issues in Journalism: Maintaining Journalistic Independence**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Christopher James Lareau, Emily M Lawton

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Christopher LaReau examines sports journalism and conflicts that arise when journalists report on hometown and favored sports teams. He identifies how journalists can maintain their objectivity in order to report fully and truthfully. Emily Lawton examines the challenges that arise when news organizations' business interests become news. She identifies how journalists can maintain their journalistic integrity while reporting on their own employers.

### **Ethic Issues in Journalism: How Much is Too Much to Report?**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Tyler Kent Jones, Kelsey Elizabeth Kramb

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Tyler Jones looks at the public's right to information about government, journalists' duty to serve the public, and government's need to keep secrets in the national interest. Jones examines when, how and to what extent journalists should disclose classified material. Kelsey Kramb looks at the ethical minefields that arise during breaking news events. She examines how the reporters can adhere to journalistic values and ethics in situations where truth is not always immediately apparent. When and how much information should journalists disclose in such cases?

### **Ethical Issues in Journalism: Minimizing Harm when Reporting on Children**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Meg Elizabeth Gramza, William Lawrence Wharton

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Meg Gramza explores the ethical challenges the press faces when reporting on sex trafficking, especially when victims are children. She recommends how journalists can meet their obligation to report truth and do so thoroughly, while minimizing risks of additional harm to the victims. William Wharton explores the ethics involved in photographing children who have been victims of crime and how photojournalists can avoid adding to children's trauma.

### **Identifying Stigma Cues in Network Television Content: Implications for Stigma Reduction Strategies**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 390 P3

**PRESENTERS** Livvie Mae Roberson, Julia D Wenderski, Nicolette Ann Westberg

**ADVISORS** Angeline L Sangalang

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The present investigation is exploring the presentation of stigmatized health conditions (such as mental illness, HIV/AIDs, etc.) in network television content. The study employs a stratified representative sample of news, entertainment, and commercial programming from four major television networks: ABC, CBS, NBC and Fox. More specifically, we are exploring information and depictions of

predictors/causes, health consequences, social consequences, markers of illness, treatment, and prevention for the health conditions. Our work contributes to the literature in two key ways as past research has: 1) often limited discussions of stigma to a single, specific context, and 2) been limited to a single type of programming. Exploring patterns and consistencies in stigma representation across health issues and across message types can provide guidance for stigma reducing message strategies for an array of health contexts and future contexts that arise.

### **Ethic Issues in Journalism: Interviewing Victims**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Molly Marie Clayton, Elizabeth C Dolehide, Caitlin Rebecca Marshall

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Molly Clayton, Elizabeth Dolehide and Caitlin Marshall examine ethical challenges that arise when journalists interview people who have been involved in tragic events, children who have been victims of crime, and people who have been sexually assaulted. The interviewing process can be cathartic for the interviewees, but it also can provoke traumatizing memories. Clayton, Dolehide and Marshall look at journalists' interviewing techniques in these specific situations, explore the potential problems, and suggest ways that journalists can be more sensitive in their interviews while still meeting their obligations to report the truth and serve the public.

### **A Fine-Grained Permission Model for Web-Based Mobile Applications**

College of Arts and Sciences: Computer Science

Oral Presentation - Independent Research

**PRESENTERS** Steven Edward Cap, Anthony Pierce

**ADVISORS** Phu Huu Phung

**LOCATION, TIME** Kennedy Union 211, 2:00-2:20

As smartphone technology progresses mobile applications (apps) developers are turning toward hybrid applications which are web language based on using web technologies due to the portability. With the rise of hybrid apps, many frameworks have been developed to make the process of creating these types of apps easier. This makes securing apps more difficult because there are more vulnerabilities in a web-based system versus using a standard native app. To combat these issues we propose a novel fine-grained permission model for hybrid apps that the users can control the behaviors of the apps. In this new model, the users can set a wide range of policies on resource accesses based on location, time period, times of accessing and so on, compared with "all-or-nothing" conventional permission model. We implemented this model by adopting a system called HybridGuard [Phung, et. al., MoST2017]. As our permission model is developed using the web technologies, it can be deployed on different mobile platforms. We evaluate our implementation on the Cordova framework, one of the most common frameworks used by hybrid app developers. We test the policies and their enforcement on various plug-ins, programming libraries to access the phone resources such as location, camera, and so on, from this framework and several related frameworks on Android and iOS mobile platforms.

### **Autonomous Self-Driving RC Car**

College of Arts and Sciences: Computer Science

Poster - Capstone Project

**PRESENTERS** Kenneth Bester, Garrett M O'Grady

**ADVISORS** Rusty Olen Baldwin

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

With the age of automation coming to machines, self driving cars will turn from a fantasy to a reality in the next decade. These machines will utilize neural networks to learn from pilot drives to ultimately be able to drive completely autonomously on any road they are put on. This project demonstrates a small fraction of the technology that goes behind a self driving car with an implementation on a 1/16th scale RC car. Using the open source software 'Donkey Car' we were able to turn an RC car into a self driving car that get more intelligent every time it drives. Mounted above the car is a 3D printed roll cage which houses a fisheye lense camera (for image recognition) raspberry PI 3 Model B (for the neural networks) and a Servo Controller(to control the throttle and steering). As a demonstration during the presentation, the car will drive simultaneously around a track avoiding obstacles, following street laws and remaining between the lines of the road.

### **HeadEx: Real-time Event Extraction and Interlinking from News Headlines**

College of Arts and Sciences: Computer Science

Poster - Graduate Research

**PRESENTERS** Matthew A Weiler

**ADVISORS** Saverio Perugini, Saeedeh Shekarpour

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In the world today, there is a lack of useful and quality approaches to structuring and semantically annotating data-sets from real-time news outlets. This research represents an essential pipeline and implementation to such a problem and includes background

data modeling, event and entity annotation, and finally interlinking events from real-time sources such as twitter headline news sources.

## Opportunities for Improvement of University of Dayton Resources Regarding Anxiety and Depression

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Emily Cecilia Goecke, Kayla Christine McCarthy, Molly Alison Murray, Rachel Ann Pavlinec

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The problem of anxiety for college students is steadily increasing. And, in recent years, anxiety has passed depression as the number one health issue specifically targeting women. Due to the stress of a changing lifestyle, college students and young adults are most affected by anxiety. If not treated, anxiety can be detrimental to sleep patterns, academic performance, and overall health. The University of Dayton provides a counseling center and some other resources for students to help cope with anxiety. However, after evaluating these resources, we found them in need of improvement. After comparing UD's resources to those available at other college campuses and speaking with fellow UD students, we determined that access to online resources may be more beneficial than traditional mediums to help treat anxiety. Because anxiety affects such a large population of college students, there are several ways to give students access to the help they need. By providing greater awareness, using technology in the form of mobile applications, and giving students 24/7 access to support, the overall mental health of college students at UD could improve. We have also created a document to inform students about the facts and opportunities for persons suffering from anxiety and depression at UD.

## Improving Access to Test Anxiety Information at the University of Dayton

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Molly Kathleen Bush, Maddi Elizabeth Conway, Joseph Cole Emery, Kaylin Ann Kultgen

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Test anxiety is a major health problem on college campuses, affecting nearly 22% of all students, according to the College Student Health Association. The resources that the University of Dayton offers to students about test anxiety were reviewed for the effectiveness of their advertising methods. From these resources, we found that there is room for improvement in access and advertisement of information. Students from freshman through senior as well as adults and professors were interviewed for their opinions and experience with test anxiety. Resources for test anxiety at other universities were compiled and used as inspiration for ideas to improve resources for test anxiety at UD. An improved brochure was created which includes symptoms of test anxiety and tips to overcome it as well as to inform students about resources at Counseling Center and the Office of Learning Resources for students.

## Got Sleep: An investigation of the sleep problem on Dayton's campus

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Nathaniel Dale Brown, Lucas William Edwards, Sara M Huber, Katie Rachel Knezevich

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Sleep deprivation has adverse effects on college students impacting their diet, memory, mood, focus, immune system, and overall health. The college lifestyle creates an environment that does not support adequate sleep. We talked with UD students to gauge their knowledge of the importance of sleep in a healthy lifestyle, and found most students are not aware of the effects that poor sleep creates in their lives. We believe the University of Dayton does not have adequate educational information regarding the importance of sleep. After evaluating the resources provided by other universities, we determined more can be done at UD to raise awareness of the pros and cons of sleep as well as other recommendations to get a better nights sleep. Our poster will describe our team's recommendation for raising awareness of this issue. We also created a document to provide a way for students to self-assess how healthy their sleeping patterns are as well as information on health issues related to sleep deprivation.

## Improving Resources and Awareness for Sexual Assault at UD

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Bethany Joy Driggers, Danny Patrick Holtz, Sydney Michele Knobel, Jack H Lundy

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a growing epidemic of sexual assault on college campuses across the United States. In light of recent events in the media, it has become clear that time is up on ignoring the signs of sexual abuse. While this time is about empowering the victims, it is also

about recognizing the detrimental effects that sexual assault can have on a college-age individual. Today, the University of Dayton has numerous campaigns in which they inform the community on sexual assault and the resources available. However, after further research and investigation, it has become clear that UD could offer more resources for students to utilize to get help. UD offers students numerous resources, both on and off campus for students to utilize. That being said, only two of these resources are available to students on a 24/7 basis. We then looked beyond UD and researched the various resources available on other college campuses. Some of the resources we found when looking in the area included student legal services, The Women's Place, The Student Advocacy Center, the Sexual Civility and Empowerment Program (SCE), and a 24 hour crisis hotline for students to call in case of an emergency. Due to a lack of information shared and posted across campus, and the lack of resources available to victims on weekends, our group has decided to recommend how UD can become a more proactive and safe place for victims to get help and share their stories.

## Strengthening Resources about Sexual Violence at UD

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Luke Alan Bressler, Elizabeth Ann Edurese, Shalom Shekinah-Arpita Reuben, Leah Ann Schneider

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Sexual violence is prevalent on college campuses across the nation. The University of Dayton has made attempts to combat this issue. The university offers resources such as counseling services, online modules, Green Dot, and advice for dealing with sexual violence on their website. Although UD seems to have an abundance of resources, an issue arises in the school's ability to spread awareness of these resources to the students. This is realized through interviews we conducted with fellow students who were largely unaware of all that the school has to offer. In response to this lack of awareness, we will provide recommendations for future ways to support victims of sexual violence as well as to reduce the number of cases each year. This past year there were 16 reported cases of sexual violence, and for the small size of our campus, this is a concerning frequency. We believe that by providing access to the school's sexual violence resources in high-traffic areas, students will become more aware of the problem and be able to easily access the information when needed. In addition to making recommendations for information more accessible, we created a document with updated information that is more specific to UD's students.

## The University of Dayton's Current Amnesty Policy and its Ramifications for Students

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Samantha Marie Achauer, Samantha Kaye Isidro, Maddie Ann Sauer

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Although universities work to provide the best environment for student health and safety, ultimately it falls on the student to be responsible for alcohol consumption. Some universities have included an amnesty policy in an effort to prioritize the health of the students over the consequences of drinking. An amnesty policy typically states that students who seek medical assistance for themselves or for others will not be subjected to University disciplinary action for violation of alcohol policies. By removing the fear of punishment, students will be more likely to report alcohol-related incidents for themselves or other students. The University of Dayton (UD) has recently changed their amnesty policy to foster a more open dialogue between students and administration regarding alcohol. However, many UD students are unaware of these changes. After interviewing several UD students, it has been established that students' knowledge of UD's policies and practices surrounding alcohol and substance abuse are relatively unknown. UD's website, resources, and transparency were compared with other universities, and we cross-compared this with rates of alcohol write-ups at the different universities. This project hopes to establish a better protocol to make students aware of the resources UD has available, as well as the main mechanism of action surrounding alcohol write-ups. In an effort to educate the campus further, we have created a document highlighting and simplifying the University's amnesty policy and the associated disciplinary and educational process for alcohol-related infractions.

## Handling Homesickness: Helping Transitioning First-Year Students at the University of Dayton Recognize and Cope with Homesickness

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Kennedy Glynn Hale, Wyatt Andrew Kaiser, Ali M Wiethe

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

According to Academia, "Up to 95% of first-year college students report some level of homesickness." The transition to college can be the biggest change many first-year students have ever dealt with. Quickly, they may begin to long for home and become homesick. With this in mind, we researched the issue of homesickness and the resources on the University of Dayton's campus and other college campuses. At the University of Dayton, the issue of homesickness is briefly mentioned on the counseling center's website. There seems to be a lack of resources and attention on our campus to this topic, which affects almost all incoming freshman at one

point in time. To investigate how homesickness affects first-year students, we interviewed current freshmen to evaluate their personal experience with these issues and how they overcame their discomfort. In addition, interviews were conducted with resident assistants on their training for these issues and how they help students become acclimated to college. Through researching other universities across the country and interviewing the community on our campus, we have created multiple suggestions for supporting freshmen during this time of change. Our goal is to provide resources dedicated to help first-year students experiencing homesickness by increasing their overall happiness on campus while also helping them become successful in their future endeavors.

## Improvement on Healthy Views of Body Image at UD

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Daniel Joseph Link, Jessie Leigh McLaughlin, Christopher James Turley, Emily Elisabeth Wey

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The National Eating Disorders Collaboration describes body image as “the perception that a person has of his/her physical self... [and] the thoughts and feelings the person experiences as a result of that perception.” Body image can be a lifelong stress and one that is especially heightened in the college years and environment. Unhealthy misperceptions of body image can lead to many dangerous consequences such as eating disorders, depression, and anxiety. Focusing on pressures such as social media and preparing for Dayton to Daytona, we sought to develop resources for UD to support individuals who struggle with an unhealthy body image. We analyzed publications produced by the Health and Counseling Centers and found that there are few resources available to students struggling with poor body images and eating disorders. Furthermore, we have found that many of the available resources are outdated, nonspecific, and poorly advertised. Pamphlets and counselors are the most noticeable resources available to these students. Resources from other Universities were explored to brainstorm ideas in which UD might improve the resources provided to students. Our goal is to improve several aspects of body image at UD, specifically creating awareness and giving resources to students who have issues with body image on campus. We want to uphold UD's values of being an inclusive community for all by creating materials for the university that promote the acceptance of all body types.

## The Search for Support: Pregnancy on Campus

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Sara Kathryn Brothers, Maddie Kay Gerdes, Elizabeth Anne Goetz, Chase Alan Sawyer, Diandra A Walker

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

At the University of Dayton, pregnancy is not a prevalent topic of discussion among undergraduate students. Recent research indicates that single mothers are less likely to receive a college degree when compared to women who are single without children or married. In addition, the number of single mothers who are undergraduate students has more than doubled since 2000. Our group investigated how prevalent pregnancy is on college campuses, and found more about the resources provided by UD. Although there are some on-campus resources, like the Women's Center and the Hand in Hand Program, there is a lack of awareness about what types of services these organizations provide. We concluded that the University should make resources more accessible for students who are pregnant or already parents. The goal of this poster is to raise awareness about what resources are available and make recommendations for improving accessibility to information on those resources. Our group will also provide a brochure, which will incorporate relevant and updated information, specifically for UD students. Our hope is that students will become more aware of what is available and feel more comfortable reaching out to utilize these services.

## Recommendations for Improving Eating Disorder Services at the University of Dayton

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Sarah Elisabeth Kane, Maria Pasqualina LaBello, Corteney K Miller, Austin Michael Mueller

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Eating disorders are most common among students 18-21 years of age and are becoming increasingly prevalent on college campuses. When no longer under the eye of family and close friends, a college student can develop an eating disorder without anyone noticing. According to the National Eating Disorder Association, 35% of all college student dieters progress to pathological dieting, and 20-25% of these students subsequently develop a full-blown eating disorder. While the University of Dayton offers health brochures and professional help through the Counseling Center, Health Center, and Campus Ministry, we believe their resources could be improved to better reach the intended population. The University of Dayton does not offer easily accessible information that specifically targets their students, nor extends their resources beyond having a student consult a professional such as a dietician, doctor, counselor, or a campus minister. While these opportunities can be effective, they should be supplemented with other resources; especially considering that many students consult help off campus to cope with eating disorders. More information should particularly be supplied on how roommates, resident advisors, friends, and other peers on campus can recognize the most common eating disorders including, anorexia nervosa, bulimia nervosa, and binge eating/compulsive overeating. Therefore, the purpose of

our research project is to examine the University of Dayton's existing programs, and how other colleges have approached eating disorders on their campuses. As a result, we will use this information to develop a document that effectively addresses possible recommendations on the University of Dayton's campus.

## Disparities in Health Literacy Examined Through Diabetes Mellitus Resources

College of Arts and Sciences: English

Poster - Course Project, 201780 ENG 366 01

**PRESENTERS** Tessa Louise Farthing, Noha Jan, Taylor Nicole Vernot

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

When an individual has a low health literacy level, their ability to successfully access and comprehend healthcare procedures and treatments is impaired. This resulting healthcare disparity is especially prevalent among individuals that speak English as a second language. Our team conducted a Health Literacy Load Test using the multidimensional model and a SMOG test in order to analyze the literacy of an existing Diabetes Mellitus resource published on MedicineNet.com. The goal for our team's project was to revise the website's content in order to accommodate the English health literacy levels of individuals enrolled in the University of Dayton's Intensive English Program (IEP). The original documents were found to be written at approximately a 12.4 grade level. The revised informational brochure that our team created was concluded to be around a 5th grade literacy level.

## Electronic communication and social media in organizations

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 372 09

**PRESENTERS** Shuo Du, Patrick Flynn Duggan, Micaela H Foley, James M Gates, Michael Dean Glaser, Katie Elizabeth Hathaway, Cameron Michael Hendershot, Daniel Patrick Kelly Jennrich, David Philip Kelley, Tillie Jean Kummerer, Carl J Leggett, Xiaoli Li, Kevin James Lynch, Mario Mathew Manta, Heather Elizabeth May, Ashley Elizabeth Mercks, Stephanie Adele Moline, P.J. Anthony Randazzo, Jack William Reilley, Jack D Schafer, Robert Conway Smyjunas, Xuanheng Wang, Conor Patrick Wood

**ADVISORS** Xiaoli Li

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Students in ENG 372 Business & Professional Writing classes participated in a virtual business professional project that involves almost 600 students in 96 teams from 14 universities in 7 countries. All teams were asked to identify an organization that has a robust online presence, such as a web page, Facebook page, Twitter feed, customer blog, and so on. Then the team analyzed the quality of these mechanisms in terms of building and maintaining the organization's reputation. They identified major conclusions about this company's online presence. Finally they wrote a report that introduces the organization and its online communication tools, provides an analysis of its online presence, and offers recommendations for improvements. They evaluated the company's reputation (built in or bolted on) and provided evidence for their conclusions. The report identified whether the organization is conveying its core values through its social media use and provide recommendations how the company can improve its online presence that address each of the conclusions. This project emphasizes the development of critical-thinking, cross-cultural communication in global contexts, and virtual collaboration and team-building skills.

## Corporate Reputation Management and Its Web Presence

College of Arts and Sciences: English

Oral Presentation - Course Project, 201810 ENG 372 07

**PRESENTERS** Rahaf M H F Al Hamad, Laylah Victoria Funk, Ben Joseph Golab, William Peter Jacobson, John Frederic Kusch, Katherine Mary Leibold, Douglas Lee Lutz, Thomas Williams Martin, Benjamin Michael McDermott, Grace Marie Moriarty, Alvaro Navarro Ilundain, Connor James Schrauth, James Eugene Studer, Conor James Tunney

**ADVISORS** Xiaoli Li

**LOCATION, TIME** Humanities 118, 10:30-12:00

Students in ENG 372 Business & Professional Writing classes participated in a 6-week virtual business professional project that involves almost 600 students in 96 teams from 14 universities in 7 countries. All teams were asked to identify an organization that has a robust online presence, such as a web page, Facebook page, Twitter feed, customer blog, and so on. Then the team analyzed the quality of these mechanisms in terms of building and maintaining the organization's reputation, especially whether the organization is conveying its core values through its social media use. Finally they wrote a report that introduces the organization and its online communication tools, provides an analysis of its online presence, and offers recommendations how the company can improve its online presence. They evaluated the company's reputation (built in or bolted on) and provided evidence for their conclusions. This project emphasizes the development of critical-thinking, cross-cultural communication in global contexts, virtual collaboration and team-building skills, as well as project management skills.

## The Things He Left Behind

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Jenna M Gomes

**ADVISORS** Chris J Burnside, Meredith L Doench, David J Fine

**LOCATION, TIME** Humanities 110, 11:00-11:20

"The Things He Left Behind" is a short story cycle inspired by the consequences of war and the power of legacy. It follows a young soldier, Felix Rocha, through the eyes of the many people that he impacted throughout his short life. This character is based off of the real-life soldier, Felix Del Greco, who was the first National Guard member to die in Iraq. The incorporation of artifacts into the story is meant to mix fiction and reality; to present to the reader both the real Felix and the fictional Felix. As Tim O'Brien famously said, "story-truth is truer sometimes than happening-truth." This short story cycle is meant to make a lasting impact on the reader, leaving them with the question, "What are the things that I will leave behind?"

## A Case Study of Student Perceptions of Transfer from First- and Second-Year Writing to the Disciplines

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Rebekah Lee Sanders

**ADVISORS** Patrick W Thomas

**LOCATION, TIME** LTC Forum, 11:30-12:30

First- and second-year required writing courses, typically housed within English departments and taught by English faculty, are valued by various stakeholders as a means of preparing students for future writing contexts. While these courses are intended to impart students with knowledge and skills to equip them for writing beyond the walls of the English classroom, students are often dubious of the value of these required writing courses to their future careers as students and professionals. As research on transfer becomes an increasingly-prominent area of focus within composition studies, the significance of students' own perceptions of the value of required writing courses has emerged as a key factor in determining how successfully they will transfer what they learn in those classes to writing in the disciplines (WID). This case study draws on insights from over 200 survey responses and six interviews to determine students' attitudes at the University of Dayton toward ENG 100 and 200 and the value of these courses to future writing contexts. Findings indicate that many students have misconceptions and questions about the purposes of these courses, which can contribute to distorted views of how transferable the skills and knowledge gained in these courses will be. In addition to shedding light on students' perceptions of transfer, this research argues for the importance of understanding students' forward-reaching conceptions of the purpose and value of writing instruction in order to ensure that transfer is possible.

## The Past is Present: Imagining Medieval Women

College of Arts and Sciences: English

Oral Presentation - Honors Thesis

**PRESENTERS** Kristen E Daly, Katherine R McCaffery

**ADVISORS** Miriamne A Krummel

**LOCATION, TIME** Humanities 118, 12:20-1:00

This Stander Symposium oral presentation will feature Kristen Daly (senior) and Katherine McCaffery (senior) and will focus on the results of their research and studies of women in medieval literature. Kristen will present her research and her resulting essay, "Agency in the Middle Ages," focusing on two stories, Ariana Franklin's "Mistress of the Art of Death" and "Tristan and Iseult." She will also share a short creative piece "The Daughters of the Wife of Bath," based on the torn nature of Geoffrey Chaucer's provocative Wife of Bath. Katherine will discuss the research and writing of her original play, "The Woman Behind the Lais." She will also examine the further research she has done for her Honors Thesis, which regards theories of temporality and women's writing, and specifically focuses on Marie de France's Lais.

## How Trustworthy is She?: Perception of International Students Toward International Peer Tutors in Writing Centers

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Raheem Terrell Rashawn Elmore, Romaisha Rahman

**ADVISORS** Bryan A Bardine, Jennifer E Haan, Andy Slade

**LOCATION, TIME** Humanities 110, 12:30-1:10

Working as a writing center graduate peer tutor for almost two years now, I have, at times, faced situations where I had to work hard to establish my credibility with the client. The most surprising, yet funny, thing is that I did not encounter this issue with any native speaker of English but with the people who speak English as their second language-- just as I do. The domestic students have appeared to be more comfortable in working with me than some of the international students. I began to wonder why this was happening, and if I was the only international peer tutor facing such issue. One thing that I have learned from majoring in Linguistics, which I have also embraced with openness, is that the flame of curiosity is what leads to the greatest of discoveries. With that idea in mind, I started to ask around. I also had a conversation with my supervisor about this issue and came to know that previous international student employees have also faced similar situations with students who shared the same native culture as them;

the students who spoke the same native tongue. This strange phenomenon interested me to such a great extent that I decided to research it; soon after, it became the topic of my Master's thesis. I am currently pursuing my Master's degree in English with a concentration in TESOL and have chosen "Perception of International Students Toward International Peer Tutors in Writing Centers" as my thesis topic. Since this biased phenomenon is a recurrent one, my research has tried to answer "why" this event takes place. From the research findings, it can be concluded that this phenomenon occurs due to the presence of native speaker fallacy; also, this native speaker fallacy is exhibited differently by different cohorts of students—giving native speaker fallacy two entirely different definitions.

## Reading Street Lit with Incarcerated Juveniles: The Myth of Reformatory Incarceration

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Jacob Scot Hale

**ADVISORS** David J Fine, Patrick W Thomas

**LOCATION, TIME** Humanities 110, 1:20-1:40

Street Literature—a popular, often young adult, genre that seeks to depict the socioeconomic realities of urban communities—has received much attention from educators and scholars of young-adult literacy. Some, such as Stephanie Guerra, advocate for its use with incarcerated youth because of its ability to resonate with their experiences of urban environments. However, the genre remains surprisingly understudied in the fields of literary and cultural studies. In my paper, I argue that Street Literature reinforces false or misleading narratives of the reformatory power of incarceration. Further, these books obscure realities such as the mass incarceration of people of color and the Prison Industrial Complex and suggest that escape from cycles of poverty and recidivism is possible with the help of determination or interpersonal relationships. To evaluate the effect of the problematic narratives on incarcerated juveniles, this paper uses an interdisciplinary approach by combining traditional literary analysis of several Street Lit works with qualitative field research. By conducting a focus group with residents at a juvenile detention center, I seek to understand if Street Lit can affect the residents' acceptance of the proposed reformatory power of incarceration inherent in many works of Street Lit. If those who study adolescent literacy advocate for the reading of Street Lit, then it's important to understand the genre's impact on vulnerable populations. Further, the better literary and cultural researchers understand the prison paradigms represented in popular literature, the better we can work to legitimize other, more constructive narratives which can counteract the existing structures of power. With this paper, I add to the conversation about how literature can contribute to issues regarding the intersection of literature and social justice.

## King Arthur as Transcendent Rhetoric of Anxiety: Arthurian Legends as Sociopolitical Paratexts

College of Arts and Sciences: English

Oral Presentation - Capstone Project

**PRESENTERS** Alexis Faith Ancona

**ADVISORS** Miriamne A Krummel, Elizabeth A Mackay, Bobbi Sue Sutherland

**LOCATION, TIME** Marianist Hall Learning Space 218, 1:30-1:50

As a recurring figure representative of the institution of kingship, King Arthur presents a unique rhetorical opportunity to examine sociopolitical anxieties of the Middle Ages. Because of his unique position, I propose Arthur himself is a text to be analyzed. With Arthur established as a text, specifically one of rhetorical significance, I analyze his subsequent iterations (historical and literary) as paratexts. Traditionally, paratextual analysis has involved an investigation of the literal and physical artifacts surrounding a text; however, by examining Arthur the figure as a text, I apply paratextual analysis theoretically. Rather than examining book bindings or author's notes, I argue Arthur's paratexts involved genre/iteration and the sociopolitical rhetoric of his authors. Through this method, I argue that Arthur is a transcendent text onto which sociopolitical anxieties are imposed, making him more than a literary figure but rather a rhetorical device of cultural memory and anxiety. Reading Arthur as such provides not only significant opportunities to recover marginalized narratives of medieval England, but also considering his continuing iterations, insight into present sociopolitical anxieties.

## When Feminism Meets Hip-hop

College of Arts and Sciences: English

Oral Presentation - Honors Thesis

**PRESENTERS** Kylie Anne Thompson

**ADVISORS** Thomas L Morgan

**LOCATION, TIME** Humanities 118, 1:30-1:50

My Honors Thesis focuses on hip-hop as a socio-political genre and as a means of advocacy via its ability to mobilize listeners toward social change. While the genre's deeply political critiques traditionally focus on matters of race and class, some female hip-hop artists challenge the sexist culture of the industry and assert a feminist voice. My research specifically engages with the ways this feminism functions in conjunction with the manipulation of gendered language, revealing how feminist strategies confront systemic sexism. Further, certain issues closely connected to the field of feminism spark controversy among feminists over what constitutes challenging the patriarchal system. In this paper, I draw on feminist thinkers as well as hip-hop scholars in order to posit a radical



feminist interpretation of contemporary female hip-hop artists, and I provide a critical analysis of their lyrics in support.

### **Considering the student perspective: An autoethnography of a graduate grant-writing internship at a local nonprofit organization**

College of Arts and Sciences: English

Oral Presentation - Capstone Project

**PRESENTERS** Katherine Jenness DeVantier

**ADVISORS** Nicky F Adams, Jennifer E Haan, Patrick W Thomas

**LOCATION, TIME** Humanities 110, 1:50-2:10

This project is an autoethnographic case study exploring the experiences of a graduate student completing a grant-writing internship with a nonprofit organization in Dayton, Ohio. Whereas previous scholarship has supported its findings with student experiences conveyed through the secondary lens of an academic professional, this project seeks to examine a professional writing internship from the student's perspective. It finds that while many of the author's experiences paralleled those outlined by other interns in established research, her internship experience overall was marked by a more consistent and lingering sense of concern not assuaged by the end of the internship. This occurrence affected the holistic view of the internship and the work she was doing. Given these results, this project outlines implications for three involved parties: the student interns, the academic institutions from which the students come, and the industry mentors as representatives of the sites at which internships take place. For students, it is important to select internship writing tasks that build from already-established content knowledge; students must also be vocal about their efforts during the internship and seek out help when necessary. For academic institutions and industry mentors, it is crucial to maintain open lines of communication and establish consistent feedback opportunities, often in more formal class settings in regards to the former. As internships continue to play a large role in preparing students for work after graduation, it is crucial that students, schools, and organizations continue to communicate about expectations and consult the primary individual undergoing the most development and growth: the student intern.

### **Murky Water, Fluid, and the Borderlands of Language: An Exploration of Toni Morrison's Beloved**

College of Arts and Sciences: English

Oral Presentation - Honors Thesis

**PRESENTERS** Julia Kristin Hall

**ADVISORS** Rebecca C Potter

**LOCATION, TIME** Humanities 118, 2:00-2:20

Centered on Toni Morrison's *Beloved* and her process of writing the novel, this thesis links the crossing of a river, the birthing of a child, and the creation of a text. By drawing upon theories of composition, feminism, and genre theory, the exploration of *Beloved* balances discussion of writing process, language, and textual analysis. Buttressed by a complimentary text, Gloria Anzaldúa's *Borderlands/La Frontera: The New Mestiza*, the connection between creation of language, identity, and body is underscored in Morrison's own process. Since this thesis analyzes *Beloved* from multiple theoretical perspectives, it is the correlations between the composition and literary approaches that provide the substance. Amongst the findings of such analysis include: the weird both in the simultaneous creation of individual and collective identity, the looping of the birthing process, the creative and destructive power of birthing, and the regulation of bodies—ideas that will be elaborated upon in the presentation.

### **Evidence in Online Political Discourse: How Everyday Citizens Argue about Politics on Social Media**

College of Arts and Sciences: English

Oral Presentation - Honors Thesis

**PRESENTERS** Diane Joy Leverich

**ADVISORS** Patrick W Thomas

**LOCATION, TIME** Humanities 118, 2:30-2:50

This study is an examination of how everyday people use evidence to engage in political discussions on the social network Reddit. com. Evidence use is especially important in online political conversations because the reporting of political events and issues can vary depending on the source and is often subject to intense deliberation. This thesis explores use of evidence in a political subreddit to examine what patterns, if any, emerge from how individuals employ evidence in constructing arguments and counterarguments in public political forums. In doing so, I am to show how ordinary citizens (i.e., those lacking political power or influence) shape their own forms of political discourse online.

### **Partnering with IEP Students to Improve Nutrition Label Education and Literacy**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Olivia Louise Bittner, Brian Douglas Davidson, Natalia Marie Iannarino, Caroline Marie Symons

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Many health care documents are written at too high a reading level for a majority of the U.S. population to comprehend. In an effort to address this problem, we revised a previous existing document on how to read a nutrition label. The original document was intended for children, but through testing it was determined to be written at approximately a ninth grade reading level. We visited a classroom of ten, level two Intensive English Program (IEP) students who wanted to learn more about understanding American nutrition labels to determine what information they are interested in. Within this visit we learned that the students understood the components associated with an American nutrition label, but wished to learn more about what foods are important to include in a healthy diet compatible with their cultural and dietary preferences. In order to cater to the IEP students, we revised the original document to approximately a fourth grade level and paid specific attention to formatting to prevent distraction from key information. We utilized culturally appropriate images and words so that these students could better understand the presented information. After revision, we presented our improved document to the IEP students to receive feedback on the readability and comprehension. With their feedback, we further revised our document so that it would more effectively communicate this information.

## **Adapting an existing health document to increase awareness about dietary supplements for the Intensive English Program**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Ibrahim Khaleel Alsulaimani, Maris O'Malley Ebeling, Emily Margaret Flaherty, Catherine Victoria Matheny

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Health literacy can be defined as an individual's ability to understand health information and integrate the information to make informed decisions in order to reduce health risks and enhance overall quality of life. We partnered with the Intensive English Program (IEP) to revise an existing health document about dietary supplements for students in this program. First, we met with level two IEP students to assess their initial knowledge of dietary supplements and to determine how the document should be tailored to meet their health literacy needs. The initial document had a readability level of 12.0 according to the Microsoft Flesch-Kincaid readability tool and the Simplified Measure of Gobbledygook (SMOG) tool had a reading level of 13.5. Our goal was to adapt the existing health document to a 3.0 to 4.0 reading level for IEP students. This was accomplished by reducing sentence structure complexity and eliminating complex terminology. This project brought to light the need for developing and adapting existing healthcare documents for marginalized audiences with low health literacy.

## **Creating a More Effective Explanation of Concussions for Intensive English Program Students**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Taylor Morgan Balk, Mark D Bugada, Caroline A Lynch, Olivia Marie Stanforth

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Low health literacy is a huge obstacle in communicating medical conditions and information to patients. An additional obstacle is created when physicians are communicating with international patients whose primary language is not English. The purpose of this project was to present written information on concussions to international students in the Level 2 Intensive English Program (IEP) at the University of Dayton in a format that they could read comfortably. For our methods, we went into the IEP classroom to assess the students' knowledge of concussions. We then used the information the students provided along with an original fact sheet produced by the Center for Disease Control to create a brochure that would help the IEP students better understand concussions. We altered the original document's wording, format, and content in order to display the information to the students so that they could better understand the material. Our document focused specifically on what a concussion is, its symptoms, and recovery tips. This final brochure corresponded with the IEP students' reading level and allowed them to comprehend the information more clearly.

## **Improving Health Resources on Snoring to Increase Intensive English Program Students' Understanding**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Andrew J Deak, Adriana Beatrice Figueroa Santiago, Carrie Anne Siekierski

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Health literacy is defined as the wide range of skills that people develop over their lifetime to comprehend and use health information to make informed choices, reduce health risks, and increase quality of life. In an effort to address the problem of health literacy, we worked with students in level two of the University of Dayton's Intensive English Program (IEP) to develop a helpful health resource about snoring. After learning from the students what they wanted to know about snoring, we were able to choose an existing health text that required a high level of literacy in order to achieve understanding. Using that text, we created a new fact sheet

with important information about snoring and delivered that information in a way that made it understandable for the IEP students. After field testing our document with the IEP students, we were able to use their feedback to make improvements and ensure the material was easy to understand. As a result of this work, after performing several analysis tests, we determined original document had an average readability level of 9.7 and rewrote it to require an average reading level of 3.9, cutting the literacy level required down by more than half. This project worked to demonstrated how to reduce the readability challenges of a health document for people of lower literacy levels in order for them to understand important health information.

## Understanding the Intricacies of Obesity

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Maddy Rae Dutton, Joseph Cole Emery, Dana Lynn Pflugradt, Collin Robert Rook

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Health literacy refers to one's understanding of healthcare information and the ability to make informed decisions when it comes to health benefits and risks. Obesity is a major health epidemic, so we analyzed and revised a health document from the Obesity Action Coalition website to enhance the understanding and readability of the document for the University of Dayton's level two Intensive English Program (IEP) students. The original document required a college-age reading level. The IEP students read at a 3rd or 4th grade level, so this document was not appropriate for this audience. We visited with the IEP students to gather information about what they already knew about obesity, what they wanted to know more about, and if they had any questions pertaining to obesity. We were then able to create a new brochure for them, making sure to address the information that was of interest. During our field test with the IEP students, we presented our draft in order to receive comments and questions. After the field testing and running SMOG and Flesch-Kincaid readability tests on the original and drafted documents, the final brochure was created and the IEP students reading level was attained. The document our group created allowed the IEP students to better understand important information about obesity, which was lost in the original document. This revision process shows how important it is to assess the readability of health documents and to make them appropriate for a specific audience.

## Semester of Service at Aullwood Audubon: Ewe, Me, and Energy

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Thomas Brewster Tappel

**ADVISORS** Craig James Attenweiler, Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This semester, my last semester, I worked full-time at Aullwood Audubon as their (in way over my head) energy engineer. During my time at Aullwood, I coordinated projects aimed at reducing the amount energy used at the Nature Center as well as developing plans for renewable energy generation and energy education. I also participated in some of Aullwood's programs and events exploring the trails throughout the 200-acre nature sanctuary, experiencing how to make maple syrup, and learning more than I could ever imagine about birds.

## Semester of Service - Volunteers of America Residential Re-Entry

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Independent Research

**PRESENTERS** Nathan Joseph Roman

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Through UD's Semester of Service program, I spent my last semester working full-time at the Volunteers of (VOA) America Residential Re-Entry facility in Dayton. This facility houses 130 clients who are transitioning from the criminal justice system back into society, and offers a number of programs to make this transition easier. At VOA, I assisted with employment readiness services (creating resumes and preparing for interviews), structured activities (life skills and recreational time), and also helped to connect clients to appropriate resources in the community.

## Semester of Service at Daybreak

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Emma O'Neill Bertrand

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

I have dedicated this semester to service for the Dayton community. Specifically, I am working with Daybreak youth homeless shelter. As a communication major, I have a gift for telling stories both written and visually. I will use these skills throughout the course of the semester to tell the stories of the people at Daybreak and to bring about awareness of the agency and all of the good that it does.

### **Semester of Service at Adventure Central**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Caroline Marie Shepherd

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Adventure Central is an after school program that encourages environmental education and appreciation. Through the Semester of Service program at UD, two group leaders were hired to work full time at Adventure Central. Semester of Service participants are acquiring experience in lesson planning and educating elementary aged school children. Adventure Central is located in West Dayton and caters to Dayton City School students. There is no where else in the country that rivals Adventure Central's success in after school programming. Adventure Central is possible through partnerships with Five Rivers Metroparks, The Ohio State University and 4-H. Semester of Service participants have their own classroom to maintain and plan for. Students at Adventure Central range from six to 18 years old. Adventure Central promotes positive youth development in the West Dayton community.

### **Semester of Service - Adventure Central**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Ellie Marie Ryan

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Adventure Central is an after-school program that focuses on positive youth development, health and wellness, and interaction with science and nature. Adventure Central assists students with any homework or school assistance needed as well as provides structured activities for after school hours. Adventure Central is a partnership between The Ohio State University, 4-H Youth Development, and 5 Rivers Metroparks of Dayton. It is located in the West Dayton community and continues to improve the lives of the students and the families it serves. This semester, as part of the Semester of Service Program, I am working at Adventure Central as a Group Leader. I am working on lesson and activity planning for a small group of students. By working in the West Dayton area, I am allowed the opportunity to immerse myself in the community.

### **Semester of Service at the Brunner Literacy Center**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Fiona Marie Madden

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Through UD's Semester of Service program, I worked at the Brunner Literacy Center. The center began serving illiterate and low-literate adults in the Dayton area in 2006, and has since expanded its services to include GED prep and English as a Second Language (ESL) tutoring. I worked to further the BLC's mission of providing a safe, welcoming place for adults to learn by acting as a program assistant and tutoring students from Dayton, Sudan, and the Dominican Republic.

### **Semester of Service at Homefull: Housing First and Homelessness in Dayton**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Alexandra M Altomare

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homefull is a non-profit agency that provides case management services to the homeless population in Dayton to help individuals escape homelessness hopefully into a stable and long-lasting independent living situation. With a housing first philosophy, Homefull casemanagement is focused on getting clients out of shelter as a top priority, with all other services to follow. As a case manager this semester, I assist clients in getting linked with services to manage their mental health conditions, stabilize alcohol and drug abuse, and find income to prepare clients for the housing opportunities Homefull is able to assist them with. The role of the case manager ranges from advocate to potential landlords, sympathetic ear to a hard day, or stern motivator to encourage clients to seek help for themselves. But no matter the task that day, the end goal is always to find a reconciliation between the poverty and lack of affordable housing in Dayton to break the cycle of neglect towards this vulnerable population.

## Semester of Service at Homefull

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Krishna Sai Phaneendar Mullanpudi

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homefull, formerly The Other Place, was founded in 1988 in Dayton, Ohio and has grown to meet the challenging needs of the community in service to homeless persons. Through UD's Semester of Service Program, this semester I have volunteered to work for Homefull as an IT intern. During my time at Homefull, I have assisted the employees with their every day tech needs and troubleshooting their issues with computers. As a Computer Science major, I have dedicated my time here shadowing different employees and made suggestions to make their work easier. I am also working on building an interface to quickly and efficiently search through different organizations such as food Pantries that will help our clients. I have had a chance to travel across different sites that Homefull serves and learn more about American society by meeting different people. It has been only one year for me in the USA and I am thankful to SOS that I was able to learn many things through this program, that my four walls classroom would have never taught me.

## Dayton Civic Scholars 2018 Cohort Presentation

College of Arts and Sciences: Fitz Center for Leadership in Community

Oral Presentation - Capstone Project

**PRESENTERS** Julia Christine Carroccio, Logan M Cobbs, Nicholas Alexander Dalton, Austin Edward Hillman, Lauren Arlene Hoody, Andrew M Kramer, Katherine Rachel Liming, John P Marron, Meghan Rose Marth, Kayla Jane McLaughlin, Maia A McLin, Kasey Anne Mulligan, Bradley Gunnar Petrella, Carlos Martin Rodriguez, Eva Justine Schuller, Emma Kathleen Welsh, Eden Kay Williams

**ADVISORS** Hunter Phillips Goodman, Gianna Marie Hartwig, Donald A Vermillion

**LOCATION, TIME** Kennedy Union Torch Lounge, 12:00-12:40

The 2018 Dayton Civic Scholars will be presenting their cumulative capstone. 17 students were chosen their sophomore year to join the Civic Scholars and plan a Capstone Project in partnership with a local neighborhood to benefit the Dayton area. The 2018 Cohort chose to plant a community garden in the Edgemont neighborhood, adjacent to Mount Olive Church. During this presentation, the students will share their experiences, challenges, and ultimate success.

## Community Engagement in the Linden Heights Neighborhood: Bringing a Community Together with Nature Play

College of Arts and Sciences: Fitz Center for Leadership in Community

Oral Presentation - Capstone Project

**PRESENTERS** Luke Mark Bachmann, Madalyn Ann Beban, Cameron Allen Cerbus, Alexandra Margaret D'Angelo, Jason Demeter, Sarah Marie Fieldhammer, Julia Kristin Hall, Abigail Anne Kowalczyk, Corey Michael Kuminecz, Meg Eileen Maloney, Emily Patricia McAleese, Christian Michael Medina, Ana Donnatella Ritz, Tia Alissa Ritz, Cody Samuel Ruffing, Megdalene B Stirn, Aaron John Svidunovich, Lori R Zagar

**ADVISORS** Leslie W King

**LOCATION, TIME** Kennedy Union 310, 1:10-1:30

River Stewards, a multidisciplinary leadership program through the University of Dayton's Fitz Center, focuses on civic engagement, protection of the Great Miami River Watershed, and service. As part of the 3-year commitment to the program, each River Stewards cohort designs and implements a Capstone Project. The 2018 cohort has composed a plan, scheduled to be carried out in March of 2018, to create an outdoor playground composed of natural materials called a "Nature Play." Located in the Linden Heights neighborhood, the Nature Play is intended to provide a space for kids, and the general populous of the neighborhood, to connect with nature in a way they might not have been able to otherwise.

## Water: More Than Just a Life Source for Ethiopian Women and Children

College of Arts and Sciences: Geology

Poster - Course Project, 201810 GEO 208 01

**PRESENTERS** Alyssa Marie Miller

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Water is a basic human right that we, as Americans, tend to take for granted. Many of us do not know the full extent of how water is unequally distributed in some areas of the world, specifically in developing countries. The objective of my research is to examine the effect of the lack of clean water in sub-Saharan Africa in general and Ethiopia, specifically on women and children. Ironically, Ethiopia is considered as a water tower of Africa and a source of the Blue Nile River, but 32% of the population do not have access to clean water. Studies indicate that the unprecedented effect of climate change on hydrologic cycle will significantly affect the availability of water in the region. Per the Huffington Post, Ethiopian women and children in some rural areas walk up to four hours a day to

fetch even non-sanitized water, which cause waterborne diseases that claim the lives of 500,000 children. This lack of access to clean drinking water has placed a burden on females and children and risk their safety by embarking on this long journey, which also loses their opportunity to attain an education. Here, I will gather data on distribution of water resources, population, socio-economic and public health from different sources (i.e, publisher articles and United Nation reports), and analyze the severity of the problem. Further, I will consider the potential effect of the country's plans to build the "Grand Ethiopian Renaissance Dam" to improve the livelihood of women and children. Finally, I will observe if there are any policies considered being passed to improve water accessibility, which would impact women and children's well-being and could lead to an education to better develop the nation.

## **Wetland Dynamics and Potential Applications within the Great Miami River Watershed to Address Elevated Levels of Agriculturally-Derived Nitrates**

College of Arts and Sciences: Geology

Poster - Course Project, 201810 GEO 208 01

**PRESENTERS** Matt Stephen Jones, Alex Robert Paschal

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Changes in agricultural practices in the Mississippi River Basin, especially high-density row crop farming and increased fertilizer usage, affect the overall total of loose, agriculturally-derived nitrates that flow through defined watersheds. Wetlands, on this note, function as filters for such water-soluble compounds like nitrates through physical mechanisms (sorption, sedimentation, and volatilization), chemical mechanisms (transformation and precipitation), and the biological mechanism of plant uptake. Thus, wetland subsections serve a vital role in watershed dynamics by removing nitrates from the macroscopic fluid-flow through the system. However, in numerous watershed-scale studies, expected empirical effects of wetlands have not been numerically realized. This is potentially due to the destructive interference between the nitrate removal effects of wetlands and the nitrate additive effects of increased crop coverage in studied regions. Thus, a study was designed and executed to isolate the effects of each of these mechanisms and compare the effectiveness of wetlands with other nitrate removal techniques; resulting from this study, it was shown that, per unit area, wetlands are five times more efficient at reducing water-soluble nitrate concentrations than the most effective land-based nitrogen removal strategies. A similar study in the Great Miami River Watershed, where more than 40% of streams do not meet Ohio's water quality standards, is vital to improve water quality and nutrient management and. Here we will use water quality data, land use and drainage maps to suggest potential wetland locations in the Great Miami River watershed that would alleviate the problem of elevated levels of agriculturally-derived nitrates within the region.

## **GLOF Modeling of Hongu Glacier Lake in the Nepal Himalayas: A GIS-based Approach**

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Katherine A Strattman

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The objective of this project is to model a glacial lake outburst flood (GLOF) of Hongu Glacier Lake, located in the Mount Everest region of Nepal, using a physically-based GIS model. Due to recent climate change many glaciers in the Himalayas have experienced rapid retreat, resulting in the development and growth of proglacial lakes. Often dammed by terminal moraines composed of unstable and unconsolidated material, trigger events such as excessive rainfall or avalanches can cause the dam to be breached, releasing massive amounts of water over a short period. Large volumes of water combined with the steep and complex terrain of the Himalayas causes serious threat to downstream populations and infrastructure. Assessing and monitoring proglacial lakes using remotely sensed images has become a widely established practice as many glaciers, including Hongu, are in unreachable, remote area. Additionally, GIS-based flood models allow for spatial analysis of risk assessment. Using digital elevation models (DEMs) derived from remotely sensed images, land cover data, and soil data as base maps, the freely available WetSpa model is applied to Hongu Glacier Lake for flood prediction. WetSpa, or Water and Energy Transfer between Soil, Plants and Atmosphere, is a physically based GIS model that simulates hydrologic processes continuously over time and space on the catchment scale. DEMs from 2015 imagery are obtained freely through NASA's Earth Explorer program, and soil and land use data are obtained from the International Centre for Integrated Mountain Development (ICIMOD). Outputs in the form of hydrographs from the WetSpa model are imported into ArcMap for analysis. Information on extent and intensity of the modeled GLOF can be used for risk assessment or future planning of infrastructure.

## **A stable isotope approach to nitrate contaminant tracing in the Great Miami River Watershed**

College of Arts and Sciences: Geology

Poster - Independent Research

**PRESENTERS** Rachel Kristine Buzeta

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The global population has been increasing exponentially and has caused several challenges surrounding sustainability, including the need for greater food production. To meet these demands and boost agricultural productivity, mechanized, more efficient agricultural practices and chemical fertilizers are used. These chemicals have resulted in water pollution and water quality degradation. Much of the Great Miami River Watershed's streams and aquifers are impacted by excessive amounts of nutrients such as nitrate originating from anthropogenic sources including use of fertilizers for agriculture, human wastes (domestic, industrial, and municipal wastes), and urbanization. High nitrate concentrations can cause ecological disturbances and affect organisms across all trophic levels. It also poses a danger to human health (nitrate levels greater than 10 mg/l) if the contaminant reaches drinking water sources. Although a network of water quality monitoring stations report nitrate concentrations in surface and groundwater, contaminant source tracing has not been done. Here we used isotope fingerprinting techniques to trace sources of nitrates. Isotopes of nitrogen ( $^{15}\text{N}$ ) and oxygen ( $^{18}\text{O}$ ) are used to identify unique nitrate isotopic signature from different sources. Our results show distinct  $^{15}\text{N}$  and  $^{18}\text{O}$  isotopic signatures from different land use and sources such as agriculture, septic systems, and animal waste. Further analysis of boron isotopes ( $^{11}\text{B}$ ) is used to distinguish anthropogenic sources (synthetic fertilizer, wastewater) from natural sources (organic fertilizer). Preliminary data has shown that different nitrate sources have different ranges of  $^{15}\text{N}$ ,  $^{18}\text{O}$ , and  $^{11}\text{B}$  values. The collective data from our first-round of sampling suggests that the isotopic composition of these sources can be used to quantify contaminants in groundwater that comes from those sources. The outcome of this research could provide a regional baseline for nitrate contaminant tracing and help to inform state and local water quality management and public health policies related to nitrate resources.

## Revising the Geological Time Scale: A Multi-Clade CONOP<sub>9</sub> Composite from the Middle Ordovician Rocks of Newfoundland

College of Arts and Sciences: Geology

Poster - Honors Thesis

**PRESENTERS** Katherine Gayle Michel

**ADVISORS** Daniel Goldman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Geological Time Scale is a fundamental tool for geoscientists that is revised and republished every eight years. It is a representation of the geologic record - a system composed of radioisotope dates interpolated into fossil successions that can be used to correlate rocks, used a standard to which local successions can be compared, and as a framework for the rate calculations needed in geologic and evolutionary studies. The current Geologic Time Scale for the Ordovician Period (GTS 2012) is composed of a sequence of species ranges from a group of fossils called graptolites with interpolated radiometric dates. Building a global geologic time scale requires correlating between different biofacies. These correlations are difficult because the fossil organisms used to demonstrate time equivalency may live in non-overlapping environments, as well as other biases inherent in the fossil record. In this thesis I will attempt to combine stratigraphic range data from different kinds of Ordovician fossils in order to improve the precision and usefulness of the Ordovician time scale. I will integrate the range data from graptolites (deep water biofacies), chitinozoans and conodonts (shallow water biofacies) in the Middle Ordovician rocks of Newfoundland. I will conduct field studies to make new, detailed fossil collections and use these in conjunction with already published literature. In particular I will look for unusual co-occurrences of both types of fossils on single bedding planes, which have been reported in the geologic literature from Newfoundland. I plan to use the computer-assisted graphic correlation program CONOP<sub>9</sub> to create composite taxon ranges from many localities based on the first and last appearance data for each species and then construct a more precise correlation network between sections that represent disparate biofacies. This correlation network can be used in the revision of the Ordovician Time Scale for 2020.

## Contrasting Patterns of Small and Large Glacial Lake Evolution in the Nepal Himalayas

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Katherine A Strattman

**ADVISORS** Umesh K Haritashya

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The objective of this research is to assess annual ice velocities of three Himalayan glaciers in the Mount Everest region of Nepal. Glaciers worldwide are important indicators of climate change due to their tendencies of attaining equilibrium under changing climatic conditions. Imja, Lower Barun, and Hongu glaciers and their respective proglacial lakes have responded by retreat and growth, but at varying rates. Imja and Lower Barun Lakes have grown rapidly, but Hongu Glacier Lake has shown relatively slower growth. Despite the little accelerating growth of Hongu Glacier Lake, the moraine is composed of unconsolidated and unstable material, and poses the threat of an outburst flood due to less freeboard area. Therefore, it is important to monitor the development of all three lakes, as well as consider fluctuations of surface velocity. Using Landsat satellite imagery, I assessed the annual changes in surface ice velocity from 1992 to 2017. The yearly images were used as inputs to COSI-Corr, a co-registration and sub-pixel correlation software, to track changes on the glaciers surface. My results indicate short-term variations, despite all three glaciers' location within the Mount Everest region, as well as similar long-term trends. Specifically, Imja, Lower Barun, and Hongu glaciers have shown long term trends of decreasing surface velocity, with varying rates of flow within each yearly pair. The three proglacial lakes have all grown at different rates as well, with Imja showing very rapid growth since the 1960s, Lower Barun showing deaccelerating growth, and Hongu showing very little growth. Understanding the dynamic nature of surface velocity can provide insight on overall glacier health, and may reveal how glaciers respond under rapid lake growth.

## Exploring the impact of El Niño and La Niña on $\delta D$ and $\delta^{18}O$ patterns in global precipitation using ArcGIS software

College of Arts and Sciences: Geology  
Poster - Capstone Project

**PRESENTERS** Amber Johnson

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This study aims to determine the impact of El Niño Southern Oscillation (ENSO) events on the environmental factors (including temperature, latitude, elevation and precipitation amount) controlling stable isotopes in precipitation utilizing regression models in the ArcGIS software. Stable isotope ratios ( $\delta D$  and  $\delta^{18}O$ ) of precipitation have been documented to be directly dependent on changes in temperature and precipitation amount in temperate and tropical regions of the world, respectively (Dansgaard, 1964). During El Niño and La Niña Southern Oscillation events, many regions of the world experience changes to temperature and precipitation amount, with some regions becoming cooler and wetter, others becoming warmer and drier, and many others experiencing patterns in between (Trenberth, 1997). Using ArcGIS, global maps will be created showing the variation in  $\delta^{18}O$ , temperature, latitude, elevation and precipitation amount for six selected years corresponding to strong El Niño, strong La Niña, and normal climatic conditions. Regression models will be performed by climate zone of the world (temperate, tropical, polar) to determine the relationship between environmental factors and  $\delta^{18}O$ . For normal years, the relationship between temperature and  $\delta^{18}O$  in temperate regions should be approximately linear ( $R^2 \sim 1$ ) and a positive trend, while the relationship between precipitation amount and  $\delta^{18}O$  in tropical regions should show a negative trend. The  $\delta^{18}O$  ratios in regions of the world that become cooler and wetter during ENSO events could be more depleted than during normal years, while regions that become warmer and drier will have more enriched ratios than during normal years. This project has immense significance in its potential to predict future patterns of  $\delta^{18}O$  globally during ENSO events, impact groundwater mass balance models, influence resource allocation in regions heavily impacted by ENSO events, and produce more accurate isotope-based paleoclimatic reconstruction models.

## Assessing Inundation Risk and Possible Race and Income Correlations

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Ryan M Matzuk

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project has two objectives: (1) map areas vulnerable to inundation and (2) determine whether or not there is a racial or income disparity between the citizens of Harris County, TX at risk of inundation compared to those not at risk. Harris County is a relatively flat, near-coastal, highly urbanized, and low elevation area. This makes it highly susceptible to inundation issues from both sea level rise and high-precipitation storms such as hurricanes. Risk areas will be determined by utilizing Hurricane Harvey precipitation data to mimic a large, high-precipitation storm as well as by utilizing sea level rise projection data for the year 2100 to reveal inundation and land-loss from rising sea levels. This analysis will be performed using multiple digital elevation models (DEMs) from 2008 to precisely measure land-surface elevation of the study area. Hurricane Harvey precipitation data will be used in order to replicate precipitation conditions of large storms. The precipitation data will be used to create a map layer in order to visualize the areas at high risk of inundation. A similar map will also be created using sea level rise predictions for the year 2100. Census block data will be applied to the study area and analyzed in order to determine racial and mean income statistics for areas inside and outside of the high-risk floodplains. This study can provide critical information needed for future planning to address climate change as well as environmental justice issues.

## Wildfire-induced mass movement susceptibility of the coastal region of northern California

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Amaris Rodgers

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The objective of this study is to identify areas susceptible to landslides caused by wildfire damage. Wildfires and mass movement are linked by a number of factors. Wildfires not only clear areas of trees and other vegetation, but the roots can be decomposed by the lack of certain nutrients that are practical for vegetation growth that were burned away. The soil also loses its strength and exposes readily erodible materials. The potential for erosion of the areas increases with these factors impaired. Data and other studies have shown that the physical and chemical changes to an area that has experienced a wildfire is at a higher risk for landslides even with average rainfall. The risk is greater in a watershed where large amount of precipitation drained into multiple outlets. The precipitation can greatly agitate the damaged land that is now looser and easier to saturate, causing it to flow. The last five summers California has experienced record-low rainfall and record-high temperature, with longer and more frequent wildfire, making it more susceptible to landslides. The goal of this project is to assess such landslide risk in Trinity Watershed in California because of its recent wildfires and its average to above average rainfall. The significance for this work is to have a better risk assessment to predict



the occurrences and damages of this particular natural disaster.

## Assessing Connecticut's flood risk using multi-criterion analysis and its implication to environmental justice

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Julie Hays

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project aims to achieve two objectives: 1) develop a flood risk map for the state of Connecticut using a multi-criterion approach based on geographic information system (GIS) techniques and compare the result with Connecticut's Flood Insurance Rate Map (FIRM) and 2) investigate the issues of environmental injustice related to the direct financial impact caused by flood insurance policies. The flood risk map is generated using publicly available data and GIS tools. To account for the many elements which are involved with flooding, the Analytical Hierarchy Process method is used to assign a weighted numerical value to the parameters which contribute to flood vulnerability. The flood risk parameters chosen to be included in the study follow the FIGUSED method: flow accumulation (F), rainfall intensity (I), geology (G), land use (U), slope (S), elevation (E), and distance from drainage network (D). The net vulnerability of an area due to these parameters is referred to as the Flood Hazard Index value (FHI). Census data is then used to determine if socio-economically disadvantaged groups are at disproportionate risk. The variables that characterize such groups include race, level of income, and level of educational attainment. The significance of this study is to identify the possibility of minority communities being disproportionately affected by a federal policy regarding flood insurance, providing information for the equitable implementation of its policies.

## Understanding Surface and Ground Water Interaction, and Water Quality using Stable Isotopes and Major Ions

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Caroline Johnstone

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Stable isotopes of oxygen and hydrogen are conservative dual tracers and provide key information about movement of water in the hydrologic cycle. Surface and groundwater are important components in the water cycle that variably interact depending on geology, topography and rainfall seasonality. Understanding the degree of this interaction is critical to determine both the quality and quantity of water. Here, we use stable isotopes of oxygen and hydrogen, and geochemical analysis of water to quantify the degree of interaction between surface and groundwater. This approach solely depends on the water chemistry and unique isotopic composition of seasonal rainfall, surface and groundwater. Water isotope data in the region is very limited to monthly precipitation isotope data in Coshocton, OH monitored by the Global Networks of Isotopes in Precipitation. To fully use this powerful tracing technique in hydrology, water resources and climate studies, establishing the seasonal variability of water isotopes in the surface and groundwater is a critical first step. Here we present a weekly water isotope data collected at four locations, Still Water River, Mad River and two locations at the Great Miami River. River and groundwater sample collection for isotopic and geochemical data analysis will continue the rest of the year to obtain seasonal isotope end members. However, our preliminary data collected for fall 2018 shows that the average isotopic composition of the rivers is 6.82‰ for  $\delta^{18}\text{O}$  and 43.24‰ for  $\delta^2\text{D}$ , and groundwater average 7.08‰ for  $\delta^{18}\text{O}$  and 44.46‰ for  $\delta^2\text{D}$ . Using this data, we employed an isotope mass balance to determine the degree of surface and groundwater interaction. Preliminary results suggest that the Miami River could contribute up to 90% recharge to the buried aquifer. The overall outcome of this research will help to quantify seasonal groundwater recharge and determine the fate of contaminants to the local aquifer.

## Climatic controls on the stable isotopic composition of precipitation in Ethiopia

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Colin McTighe

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project aims to determine what major climatic factors control the variation of the stable isotopic composition of precipitation in Ethiopia. In the past, the variations of stable isotopes of precipitation have been linked to the North-South migration of the Intertropical convergence zone (ITCZ). However, recent studies suggested that the link between the ITCZ and the arrival of rainy seasons in Ethiopia do not provide enough explanation for the precipitation isotope values. In this study we examine the stable isotope values of precipitation for four stations throughout Ethiopia from August 2012 – August 2013, and determine how they are affected by a variety of climate factors including: local temperature and precipitation amount, sources of moisture (established through HYSPLIT modeling), convective intensity of moisture source region (estimated by the Outgoing Longwave Radiation (OLR)), wind circulation patterns, and moisture flux and transport. Our results will provide more insight to the control of precipitation isotopes in the tropical region, which is important for accurate interpretation of climate proxy data.

## Utilizing GIS and Multi Variable Analysis to determine optimal wind farm site locations in Ohio

College of Arts and Sciences: Geology  
Poster - Capstone Project

**PRESENTERS** Kyle Hrabak

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project aims to determine the most optimal locations for the implementation of utility scale wind farms within the state of Ohio. The use of fossil fuels for electrical energy production is one of the world's largest contributors to the growing atmospheric concentration of carbon dioxide, known for having long term impacts on climate. Developments and growth in the clean energy sector have offered alternatives to current dominant methods of energy production, with specific focus into wind powered electrical generators. Wind turbines are a carbon free source of energy, but are limited in use due to restrictions of needed wind energy. This form of energy is widely available in enough quantities across the Midwest region to be a viable source of electrical generation. As such this project aims to look at all variables that need to be taken into account to determine optimal sites for wind farms in the state of Ohio. Factors of consideration include wind energy, land cover, soil type, roughness of terrain, elevation, slope, orography, road access and environmental impacts. Data regarding all of these factors is collected and processed using a geographical information system, ESRI ArcGIS, creating a spatial representation of suitable areas for development. Within the GIS system, an analysis technique known as multi-variable analysis is conducted assigning weights to various factors and calculating an overall suitability score to be ranked and investigated as optimal sites. The finding of this report are to provide a starting point for clean energy implementation in the state of Ohio for which currently only has renewables accounting for 3% of the state's energy production.

## Analysis of Environmental Effects of Chemical Deicers in the Southwestern Ohio

College of Arts and Sciences: Geology  
Poster - Course Project

**PRESENTERS** Christopher Alexander Barrett

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In the modern age, virtually every sphere of society uses various manufactured chemicals. Factories use various lubricants to improve machine up time, sanitation crews use disinfectants to annihilate bacteria, and farmers use specialized fertilizer to improve crop growth. The use of these chemicals can be extremely helpful, and in some cases necessary to keep the wheels of modern society rolling. However, while these chemicals help, in some cases they can be very hazardous to individuals or the environment if not handled properly. This is the case with excessive use of chemical deicers that can runoff from roads into water and negatively affect freshwater wildlife. This project uses deicers as an example for the potential health and ecological effects that can be caused from the use of environmentally harmful chemicals, and attempts to highlight practices that minimize these risks.

## Niagara Falls in Ohio? – geomorphological and geological expression of the Niagara Escarpment in the vicinity of Dayton, Ohio.

College of Arts and Sciences: Geology  
Poster - Course Project, 201810 GEO 495 01

**PRESENTERS** Thomas Daniel Bashore, Deja Juanita Branch, Frances Coletta Jelinek

**ADVISORS** Michael R Sandy

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Niagara Escarpment is a significant landform that runs for hundreds of miles in the northern United States and Canada; from eastern Wisconsin through Ontario to central New York State. The most famous part of this feature is no doubt the Niagara Falls and the Niagara Gorge on the Niagara River, between New York State and Ontario. The geology underlying the Niagara Escarpment comprises Paleozoic Era sediments: Silurian carbonate rocks that are more resistant to erosion overlying more easily eroded sediments from the Ordovician Period; conditions necessary for a waterfall to form. This pattern can be traced along the length of the Niagara Escarpment. What is perhaps less well-known is that in the Dayton area the same age rocks outcrop in a similar relationship along the rim of the Cincinnati Arch expressed at a number of local scenic sites (parks and reserves): for example, Glen Helen, Clifton Gorge, Charleston Falls, Patty Falls (Englewood Metro Park); many with waterfall features clearly not as high as at Niagara Falls but with the same basic geological framework as the latter. The local expression of the Niagara Escarpment is due to an isolated geological inlier, where older rocks (Ordovician age) are overlain by Silurian rocks. We have investigated the geology and geomorphology of some sites in the Dayton area along SW Ohio's Niagara Escarpment. It is possible to document variation in the geology of the escarpment depending on location along the Cincinnati Arch and depth of erosion. Geomorphological features associated with karst landscapes (limestone solution) of the Silurian sediments have also been investigated. In addition the potential to develop educational materials on this local resource is being explored.

## Colonization to Globalization: French-Algerian Integration Analysis from Historical, Societal,

## and Economic Perspectives

College of Arts and Sciences: Global Languages and Cultures

Oral Presentation - Honors Thesis

**PRESENTERS** Stephanie Soledad Rodriguez

**ADVISORS** Nicola C Work

**LOCATION, TIME** Kennedy Union 311, 1:00-1:20

This cross-disciplinary research on French-Algerian relations is designed to expose the influence of historical, societal, and economic perspectives on the present and future of cultural and economic integration. Using a multi-disciplinary approach to analyze French-Algerian integration, this research comprehensively leverages seemingly unrelated factors that have impacted the transition of France-Algeria from European colonization to African globalization. In this work, their colonial history and statistics on population, immigration, and employment are used to introduce the development of French-Algerian relations. Using demographic data on French and Arabic language usage and Islamic religious affiliation, as well as surveys on immigrant national identity, this research considers French and Algerian government policies that shaped the development of their economic relations. As Algeria currently seeks economic diversification in a time of declining oil prices and current French politicians recognize the need to ameliorate France's relationship with Algeria, this work describes cooperation opportunities for both France and Algeria that could result in long-term societal cooperation and economic stability.

## Autobiographical Memory Recall in Spanish-English and English-Spanish Bilinguals

College of Arts and Sciences: Global Languages and Cultures

Oral Presentation - Honors Thesis

**PRESENTERS** Hannah N Klein

**ADVISORS** Jorge Aguilar-Sanchez

**LOCATION, TIME** Kennedy Union 312, 1:00-1:20

Research in bilingualism continues to morph over time in distinctive manners, especially in conjunction to the area of memory and its relationship to language. Various studies have been conducted in accordance with developments in autobiographical memory research and foreshadow the possible connections that language has to personal memory. This study seeks to further understand how these two human characteristics interact, specifically in Spanish-English and English-Spanish bilinguals. It focuses on whether a particular language aids in the recall of memories. To achieve this, I study how participants relay autobiographical memories in oral interviews. Participants are cued to recall particular moments in their past. Interviews are transcribed and memory recalls are coded. Data are analyzed to find any correlation between the language used to recount and the event type. It is expected that the recollection of these events will be different and that the dominant language of the individual will not only affect recall, but also the way in which events are communicated.

## Exploring Medieval Social History

College of Arts and Sciences: History

Panel Discussion - Course Project, 201810 HST 486 01

**PRESENTERS** Emily Grace Janowski, Joe Sutcliffe Milton, Ciaran A Minch, Cong Shao

**ADVISORS** Bobbi Sue Sutherland

**LOCATION, TIME** Kennedy Union East Ballroom, 11:45-12:45

This panel will include four papers from HST 486, each of which will address an aspect of medieval or early modern social history. Cong Shao's paper, *Children's Lives in the Middle Ages*, will consider the nature of childhood - from play to education - in the Middle Ages. Joe Milton will discuss student life in the Middle Ages in his paper entitled *Student Life at the Medieval University*. Ciara Minch's paper, "The Truth Behind Mary Queen of Scots", will consider the historical reality behind this heroine of Catholic and Scottish history, villain of Protestants. Emily Janowski will talk about the way that the medieval law surrounding raptus changed, actually resulting in women having less control over their own bodies. Her paper is entitled "Lost in Legal Reformation: How Women Were Affected by Medieval Rape Laws."

## International Studies Capstone: Human Rights and Security in East AsiaPart 1: Security and BordersPart 2: Social Inequality and Political ActivismPart 3: Political Violence: State and Non-State ActorsPart 4: Expression not Suppression

College of Arts and Sciences: History

Oral Presentation - Capstone Project

**PRESENTERS** Brittany Cheyenne Archie, Kaitlynrose Emilie Bicek, Alexis D Bovell, Devon Amelia Dubiel, Mia Elizabeth Karam, Abigail Anne Kowalczyk, Emily Clare Monczynski, Karen Najwa Naim, Bradley Gunnar Petrella, Jade Alicia Poa, Mercedes Cecelia Ramsey, Joseph Robert Schneider, Lauren Potter Stamatel, Lora Christine Vonderhaar, Cierra Lynn Waller, Emma Kathleen Welsh, Alia Francesca Whitney, Eden Kay Williams, Erin Mary Winchester, Victoria Lynn Young

**ADVISORS** Christopher S Agnew

**LOCATION, TIME** Kennedy Union 331, 12:00-2:40

The International Studies capstone asks students to use the knowledge and skills they have developed at the University of Dayton to produce a task force report on a critical topic of contemporary global concern. Students will collaborate as a class to develop a research plan in response to the task force prompt, analyze the relevant historical and political contexts, and provide a set of clear and specific policy proposals. This year's task force topic is "Human Rights and Security in East Asia." Each student has been assigned a country, analyzed a problem of critical human rights or security concern, and formulated a set of policy solutions.

### **Three Strikes Against Her-She was Black, a Woman, and a Pentecostal: Ida Bell Robinson and the Mount Sinai Holy Church of America, Inc. (1924-1946)**

College of Arts and Sciences: History  
Oral Presentation - Graduate Research

**PRESENTERS** Dara S J Delgado

**ADVISORS** William V Trollinger

**LOCATION, TIME** Humanities 122, 1:00-1:20

Ida Bell Robinson is a relatively unknown twentieth-century American Pentecostal pioneer. Essential to this story is the recognition that Robinson was a Black woman brazenly asserting herself into a role typically reserved for men, within a religious tradition socially rejected and deemed as scandalizing and unseemly. In this, Robinson had three strikes against her: she was Black, she was a woman, and she was a Pentecostal. Despite all of that, Robinson eschewed social constructs of womanhood—even the insufficient form that was available to her as a black woman during this era—as well as the traditional roles set aside for black women. As such, "Bishop Robinson" took to the road overseeing churches affiliated with her ministry and planting new churches to draw more disciples. Moreover, when she was not acting in the role of "bishop," Robinson was mentoring other women to be leaders, managing a radio program, publishing a denominational newsletter, and acquiring properties. Her work also included a social awareness that sometimes took its form in her sermons. Specifically, through the art of preaching Robinson addressed lynching, economic and racial injustice, and the war—which landed her on the FBI list. Therefore, with careful consideration to how Robinson, seemingly unbothered by the very real social and religious glass ceilings of her day, established the MSHC which she led until her death in 1946, this paper will explore how she, as a Black woman in the early twentieth-century, created a religious denomination with the purpose of empowering women to lead mixed-gendered congregations and to occupy the highest positions of ecclesial authority and government. Moreover, I will argue that Robinson's story has much to say about Black Holiness-Pentecostal history, Black history, and American women's and religious history.

### **The Irish Question: Woodrow Wilson, the Irish, and Irish-American Diplomacy**

College of Arts and Sciences: History  
Poster - Honors Thesis

**PRESENTERS** Ryan Joseph Westerbeck

**ADVISORS** William V Trollinger

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Irish Question was the title often given to nationalist and independence movements in Ireland in the early 20th century. Several attempts were made to secure Ireland's independence in the early 1900's, the most famous of which is the Easter Rising in 1916. This thesis concerns the period immediately following those events, from 1916 through 1920. The end of the Great War caused many nations to look for independence and international recognition at the Paris Peace Conference, often due to President Wilson's own words. During this period, several prominent Irishmen and Irish Americans attempted to reach out to President Wilson to support the Irish independence movement. These attempts were unsuccessful. The following thesis will explain how the representatives of the Irish cause attempted to convince Wilson and the reasons why they failed in securing the support of the United States government.

### **My Semester of Service at the Brunner Literacy Center**

College of Arts and Sciences: History  
Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Fiona Marie Madden

**ADVISORS** Christopher S Agnew

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Brunner Literacy Center serves the considerable but largely unrecognized segment of the adult population with low literacy skills. By working with individuals to improve their reading skills, earn their GED, or learn English as a second language, we empower them to improve their lives and their communities. Adult education programs have proven positive impacts on families and communities, including reducing crime and recidivism rates, high school dropout rates, and life expectancies.

### **Fault Lines: Geopolitical Rivalry in the East China Sea**

College of Arts and Sciences: History  
Poster - Honors Thesis

**PRESENTERS** Nicholas Alexander Dalton

**ADVISORS** Christopher S Agnew

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Senkaku Islands dispute in the East China Sea stands as a major territorial dispute between the People's Republic of China (PRC) and Japan. This dispute has periodically reemerged in the interactions between these two states between 1895, when the Senkaku Islands were definitively administered by Japan, and the present day. The dispute has undergone significant changes in its emphasis by both the PRC and Japan, as well as what the dispute is about. At its early stages, the Senkaku Islands dispute was largely ignored by both China and Japan. Even between 1971 and 1978, when the Senkaku Islands dispute entered its modern form, the dispute was deemphasized to promote normalization of relations between the PRC and Japan. However, after the 1980s, with a rising PRC and somewhat economically and militarily weaker Japan, the dispute emerged with new intensity. In turning to the focus of the Senkaku Islands dispute, this has involved both economic interests, such as the resources in and around the adjacent seabed, as well as elements of popular nationalism. The Senkaku Islands dispute has created significant tensions and military development between Japan and the PRC. This paper examines how the Senkaku Islands dispute has driven militarization between the PRC and Japan.

## Evaluating the Effectiveness of U.S. Anti-slavery Legislation through the Lens of Supply Chain Management

College of Arts and Sciences: Human Rights Center

Oral Presentation - Honors Thesis

**PRESENTERS** Alexander M Mingus

**ADVISORS** Tony Neil Talbott

**LOCATION, TIME** Kennedy Union 311, 12:00-12:20

Whether knowingly or unknowingly, business supply chains are often tainted with slavery and forced labor practices. In an effort to address this reality, the California Transparency in Supply Chains Act of 2010 requires companies in California to publish a disclosure statement describing companies' efforts to prevent this potential abuse. This study evaluates the effectiveness of the California legislation by observing media trends and conducting expert interviews with business leaders, academics and legislators. This data reveals strengths and weaknesses in the California legislation, which informs future attempts to create anti-slavery legislation addressing corporate supply chain abuses.

## Chaminade Scholars Journey Through Laudato Si

College of Arts and Sciences: Institute Pastoral Initiative

Interactive Display - Course Project, 201810 ASI 357 H1

**PRESENTERS** Kelsey Marie Albertino, Caroline Mary Compton, Jonathan W Conrad, Kelly F Fuller, Kaitlin Marie Gawkins, Elizabeth Anne Goetz, Luke Christopher Horner, Matt Patrick Leverick, Nathan George Mansour, Jean Yvan Munyankindi, Ellie Elise Rizzo, Joshua Wayne Romo, Taylor Kate Tovey, Corinne Mallory Woodruff, Yu Zhao

**ADVISORS** Maria Ollier Burkett, Angela Ann Zukowski

**LOCATION, TIME** Alumni Hall Basement, 11:30-2:30

An interactive journey experience through Laudato Si, Pope Francis' Encyclical, in order to engage with the dual reality of a throw-away culture and the beauty of our world. With a focus on community, world, and God, individuals are able to reflect on relationships as opportunities for promotion of positive change in the spirit of caring for all of creation.

## The comparison of FD and RBFs collocation methods for the solution of the heat equation

College of Arts and Sciences: Mathematics

Poster - Graduate Research

**PRESENTERS** Lijun Lin

**ADVISORS** Muhammad Usman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The heat equation is widely used in various fields such as in industry and medicine for thermal treatment of the tumor. In this work, we are going to use two different numerical methods to solve the heat equation. It is known that Finite Difference (FD) and Radial Basis Functions (RBFs) collocation methods are both trustworthy for solving heat equation. To show the difference between the two methods, we would like to display the comparison by the final results, the error between approximate solution and exact solution, and other parameters in those methods.

## Finding the probability of being selected an NBA All-Star

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Matthew Paul Forte

**ADVISORS** Peter W Hovey

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Halfway through the National Basketball Association, there is an All-Star break where the 24 best players are selected to participate in an All-Star game. Being selected as an all-star has many implications for the player and his organization, including salary bonuses and legacy concerns. This project aims to identify the probability that players in the National Basketball Association will be selected as an all-star. The model uses a number of statistical indicators including points per game, assists per game, rebounds per game, efficiency ratings, and more.

### Minimal perimeters of triangles with fixed area and foot

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Hang Luo

**ADVISORS** Jonathan H Brown

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Triangle with the same area can have different perimeters. In this project we are exploring the question of when those perimeters are as small as possible. With no further conditions, the answer to this question is known: the minimal perimeter is obtained by an equilateral triangle. We can explore the question under the condition that location of the height is fixed. In this case the minimal perimeter can be obtained by variety of different triangle types. We want to know which type of a triangle has minimal perimeter based on the location of the height.

### A Business Application of Markov Chains

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Emily Lynn Seals

**ADVISORS** Muhammad N Islam

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The purpose of this project is to look at the economic applications of Markov Chains and stochastic matrices in a real-world problem. For this project, I studied a specific case for a rental car company which has a fleet of vehicles for rent in a number of locations. It is very important for the company to know the number of vehicles that will be available on a typical day at each location. This project will show that, on a typical day, the number of available vehicles at the various locations can be known by calculating what is called the steady-state vector of the stochastic matrix associated with the problem. This will help the company to better manage the customer demands. It can then be used to meet any increased demand at a particular location which can occur due to various reasons.

### Unique Approaches to the Finite Difference Method

College of Arts and Sciences: Mathematics

Poster - Honors Thesis

**PRESENTERS** William Thomas Shovelton

**ADVISORS** Muhammad Usman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The oldest and most useful technique to approximate the solution of differential equations is the finite difference method (FDM). This technique allows for derivatives to be replaced by the finite difference discrete approximation, hence we get a finite difference equation (FDE). As with all numerical solutions, this method is only an approximation and there will be errors due to rounding and discretization. Over the years, new approaches to the FDM have been derived to improve the stability of the numerical solutions. These unique approaches are referred to as nonstandard finite difference methods (NFDM). The focus of this project will be to determine the effectiveness of two different NFDM proposed for an autonomous dynamical system and a class of reaction-diffusion equations. Effectiveness will be based on the accuracy to the exact solution and stability.

### STEM Stories After-School Program

College of Arts and Sciences: Mathematics

Oral Presentation - Independent Research

**PRESENTERS** Caelin Marie Micks, Lisa Jane Musselman, Haley N Rusnak

**ADVISORS** Shannon Olivia Schirack Driskell, Marie Margaret Pinnell, Mary Catherine Sableski, Todd B Smith

**LOCATION, TIME** Kennedy Union 207, 10:30-10:50

The STEM Stories afterschool program is held at Kiser PreK-6 School, a Dayton Public School where 93% of the students live in poverty and are from various ethnic backgrounds, including black American, white American, Turkish, Hispanic, African, and others. We are providing instruction to approximately 20 second-, third-, and fourth-grade students. These students are not on track to pass the Ohio Third Grade Reading Guarantee, which mandates schools to identify at-risk readers through diagnostic assessments and to provide specific interventions, such as intensive reading instruction and afterschool programs (Ohio Department of Education, 2016). We are making a difference and influencing these students' lives through innovative, engaging, fun, and highly integrated literacy and STEM activities that reflect research-based best practices for improving literacy and attracting underrepresented

populations to STEM. We are supporting these students' academic and social needs and engaging with the Dayton community, while developing critical and innovative teaching skills. The relationship we have developed with the teachers at Kiser PreK-6 School—and with the children in the Literacy and STEM program—is unique. As undergraduate students, we accepted leadership of the delivery of the lesson plans in the afterschool setting. We work in collaboration with the inservice teachers and the university faculty to develop and deliver innovative lessons. The benefits to these relationships are evident at many levels, including to the Kiser students, teachers, UD faculty, and our own professional development. During this session, we will share our responsibilities to this afterschool program, what we have learned, samples of the activities we are teaching, and samples of students' work.

### **Uniqueness and existence of solutions of boundary value problems at resonance for ordinary differential equations.**

College of Arts and Sciences: Mathematics

Oral Presentation - Graduate Research

**PRESENTERS** Jabr Ateeg Allah Aljedani

**ADVISORS** Paul W Eloe

**LOCATION, TIME** Kennedy Union 207, 11:00-11:20

A quasilinearization algorithm is developed for a specific boundary value problem at resonance. To do so, a standard monotonicity condition is assumed to obtain uniqueness of solutions for the boundary value problem at resonance. Then the method of upper and lower solutions and a shift method is applied to obtain the existence of solutions. A quasilinearization algorithm is developed and sequences of approximate solutions are constructed that converge monotonically and quadratically to the unique solution of the boundary value problem at resonance.

### **Prospect Theory: An Analysis of Decision Under Risk**

College of Arts and Sciences: Mathematics

Oral Presentation - Capstone Project

**PRESENTERS** Wyatt Michael Ohm

**ADVISORS** Dan Ren

**LOCATION, TIME** Kennedy Union 312, 11:00-11:20

Prospect Theory, developed in 1979 by Daniel Kahneman and Amos Tversky, attempts to describe how individuals make choices between probabilistic alternatives where risk is involved and the probabilities of different outcomes are unknown. Choices among risky prospects exhibit many different effects that are inconsistent with the expected utility theory. I will explain examples of studies that touch upon the certainty effect, isolation effect, and reflection effect. Based on these examples and findings, two functions will be introduced and explored: the value function and the weighting function. The value function is defined as concave for gains and convex for losses; and the weighting function, is usually higher (lower) than the corresponding probabilities when probabilities are low (high).

### **Evaluation of Iodine Concentrations and its Effect on Neurodevelopment**

College of Arts and Sciences: Mathematics

Oral Presentation - Independent Research

**PRESENTERS** Marina Mancuso Li Mancuso

**ADDITIONAL AUTHORS** Daniel Finklestein (Georgia Institute of Technology), Dominique Forbes (Coastal Carolina University), Heidi Whiteside (Winston-Salem University)

**ADVISORS** Muhammad Usman, Alan A Veliz-Cuba, Andrew Wright (North Carolina State University)

**LOCATION, TIME** Kennedy Union 211, 11:30-11:50

Iodine plays an essential role in developing thyroid hormones, thyroxine ( $T_4$ ) and triiodothyronine ( $T_3$ ). These hormones are secreted by the hypothalamic-pituitary-thyroid (HPT) axis and are suggested to impact fetal neurodevelopment. A novel biologically based dose-response model developed by the students of the Modeling Applied and Industrial Mathematics REU at North Carolina State University analyzes the dynamics of iodine and thyroid hormone concentrations interacting between a pregnant rat and fetus. Parameter optimization and sensitivity analysis contributed to further understanding of the factors that influence the development of  $T_3$  and  $T_4$  due to iodine deficiencies.

### **Probabilistic Modeling of Student Interaction during a Passing Period at the University of Dayton**

College of Arts and Sciences: Mathematics

Oral Presentation - Honors Thesis

**PRESENTERS** Allyson J Pacifico

**ADVISORS** Ying-Ju Chen, Peter W Hovey

**LOCATION, TIME** Kennedy Union 312, 12:30-12:50

The University of Dayton is composed of five colleges and schools: College of Arts and Sciences, School of Law, School of Business

Administration, School of Education and Health Sciences and School of Engineering. The University of Dayton is composed of about 11,000 students on campus who all have distinct class schedules and paths they take between their classes. In this study, I wanted to know the probability of meeting my friends with a different class schedule as I walk between classes. The data consisted of one to two students from each college, except for the School of Law, who documented their paths on a modified campus map for a week. Using R, the simulation randomly selects two paths from the data, generates a random time between each node and compares the time of the identical nodes to see if the students were to have met.

## 16th Annual Integration Bee, Mathematics

College of Arts and Sciences: Mathematics

Interactive Competition - Independent Research

**PRESENTERS** Vicki L Withrow

**ADVISORS** Arthur H Busch, Maher B Qumsiyeh

**LOCATION, TIME** Science Center 255 - Chudd Auditorium, 1:00-2:00

The students compete in teams of 2-3 people. This is organized in a similar way to the traditional spelling bee. Teams will be evaluating integrals that are projected on a screen. If a team incorrectly evaluates an integral, the team is eliminated from the competition. After the elimination rounds, we will hold the lightning rounds. The first 'y' many teams to correctly evaluate the given integrals will proceed to the next round. We do this until there is a 1st, 2nd, and 3rd place team. First, second, and third place teams will receive math t-shirts. The department of mathematics will host a pizza lunch in the Science Center Atrium from 12:00-1:00 PM prior to the Integration Bee.

## Construct Finite Fields with a Finite Elements

College of Arts and Sciences: Mathematics

Porch Project - Capstone Project

**PRESENTERS** Junyu Lin

**ADVISORS** Andres Larrain-Hubach

**LOCATION, TIME** 461 Keifaber Street, 1:15-1:30

A field is a set with two commutative operations called sum and product, such that every nonzero element has a multiplicative inverse. For example, the rational numbers form a field but the integers do not. In this talk, I will show how to construct fields with a finite number of elements. If there is enough time, I will show some results concerning polynomials on these "finite fields".

## The Riemann Hypothesis

College of Arts and Sciences: Mathematics

Oral Presentation - Course Project, 201810 MTH 404 H1

**PRESENTERS** Amelia Isabella Pompilio

**ADVISORS** Andres Larrain-Hubach

**LOCATION, TIME** Kennedy Union 207, 2:00-2:20

Bernhard Riemann only wrote one number theoretic paper in his career as a mathematician. However, within this single paper is one of the most important topics in number theory: the Riemann Hypothesis. The Riemann Hypothesis remains a hypothesis, not a theorem, to this day. The statement of the hypothesis is important to the distribution of prime numbers. Mathematicians so far have good estimates for locating prime numbers within the number line, but they are still only estimates. The Riemann Hypothesis would provide the clearest picture of how the prime numbers behave, if it could be proven true. If the Riemann Hypothesis were proven, the implications of its truth would reach much further than just the prime numbers. Many other areas of mathematics and physics depend on the unproven Riemann Hypothesis in some way. This talk will outline the statement of the Riemann Hypothesis and why it matters.

## Transformations in Hyperbolic Geometries

College of Arts and Sciences: Mathematics

Oral Presentation - Capstone Project

**PRESENTERS** Jennifer Lynn Brustoski

**ADVISORS** Jonathan H Brown

**LOCATION, TIME** Kennedy Union 312, 2:30-2:50

We can rotate, reflect, translate a shape without changing it. These are called the transformations of Euclidean Geometry. We can define Euclidean Geometry using these transformations. In this talk, we will explore how to move shapes without changing them in hyperbolic geometry. We will include a series of activities to introduce high school students to hyperbolic transformations.

## Determination of Stock Prices and Interest Rate's Behavioral Movement By Utilizing the Brownian Motion

College of Arts and Sciences: Mathematics



Poster - Capstone Project

**PRESENTERS** Matthew Scott Hooper

**ADVISORS** Dan Ren

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Below is a look into the Brownian Motion, and how it is able to portray the erratic movement over time of stock prices and interest rates. Further, is a look into how different financial models such as the Ho-Lee Model and Vasicek Model are able to utilize this brownian motion in order to describe the movement of short term interest rates and thus can be used to carry out various financial valuations, such as bond option pricing and evaluating interest rate futures.

## Forecasting Rain Using Logistic Regression

College of Arts and Sciences: Mathematics

Poster - Independent Research

**PRESENTERS** Alsomali Ibrahim Y Alsomali

**ADVISORS** Maher B Qumsiyeh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Prediction and forecasting using logistic regression have exploded during recent years. Logistic regression modeling now used in almost all kind of knowledge. Rainfall is an important event in the climate system. Whether it rains or not has a big impact on several life areas such as nature, agriculture and animal life. Thus, we need to be able to predict rainfall. In this paper, we show how to use logistic regression for predicting rainfall. Ten years of daily rainfall data used to build the model. Two extra years of observed daily rainfall data used as a validation of the model. Our finding shows that logistic regression model can predict the rainfall very efficiently.

## Runge-Kutta Methods to Explore Numerical Solutions of Reactor Point Kinetic Equations

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Elizabeth N Boeke

**ADVISORS** Muhammad Usman

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This work is the study of Reactor Point Kinetic equations. This is a system of seven coupled ordinary differential equations, one for neutron density and six for delayed neutron precursors. The application of Runge-Kutta methods is used to study the system numerically. Solutions were then compared for different values of reactivity using MATLAB built-in functions ode23 and ode45. There are graphs and tables presented to compare these methods; theoretically ode45 is of higher-order than ode23.

## Interpolation Methods

College of Arts and Sciences: Mathematics

Poster - Independent Research

**PRESENTERS** Mohamed Khalifa I Aburakhis, Mohammed Mutlaq Almatrafi

**ADVISORS** Muhammad Usman

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In this work, the interpolation methods, Polynomial interpolation, Cubic Splines interpolation, Akima cubic spline interpolation, Sinc function interpolation, and Radial Basis Function interpolation are implemented using MATLAB. The derivation and mathematical equations are presented. Finally, all methods are applied to one example for the sake of comparison. There is not enough literature on the comparison of interpolations methods, this work is an attempt to provide a survey of above methods.

## Group Songwriting as a Self-Care Practice Among College Students

College of Arts and Sciences: Music

Stander Undergraduate Fellowship Awardee

Poster - Independent Research

**PRESENTERS** Victoria Clare Obermeier, Emily Rose Robinson

**ADVISORS** Susan C Gardstrom

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The present study explores how group songwriting may positively contribute to self-care in the University of Dayton student community, as well as among the music therapy community. College is a time of intense stress and anxiety; thus, self-care is essential in order to maintain both physical and mental health, as well as overall functioning. Our research shows that university mental health services are highly underutilized. Some of the aims of this study are to increase visibility of self-care practices and to provide students with the additional self-care tool of songwriting, all in efforts to de-stigmatize mental illness.

## Thy Kingdom Come: Catholicism and the Nueva Canción, 1966-1982

**College of Arts and Sciences: Music**

Oral Presentation - Honors Thesis

**PRESENTERS** Elizabeth Mary Turnwald**ADVISORS** Samuel Noah Dorf**LOCATION, TIME** Kennedy Union 311, 10:30-10:50

Within Latin America's tumultuous political atmosphere during the 1960s through the 1980s, a grassroots musical genre called the nueva canción emerged. Meaning "new song," it sought to unify the poor and marginalized through a combination of folk influences, indigenous musical styles, and politically-charged lyrics. Although they achieved similar commercial success to U.S. contemporaries such as Pete Seeger, Woody Guthrie, and Joan Baez, the folkloristas [folksingers] of the nueva canción often incorporated references to and elements of Catholic liturgical practice. Considering the reforms of the Second Vatican Council and the advent of a Latin American Liberation Theology, the time was ripe for cultural revolution by the poor, for the poor. While military dictatorships and civil wars ravaged many Central and South American countries, many of those who were suffering sought refuge in Christian Base Communities. These small groups of lay Catholics would meet regularly to discuss the week's Scripture, to sing and pray together, and most importantly, to heal. The unorthodox, yet explicitly religious, nature of these groups offered opportunities for non-liturgical and popular music to enter a paraliturgical setting. In this project, I seek to contextualize the nueva canción within this distinct intersection of the sacred, the secular, and the genre's specific mission of social justice. Considering the ubiquitous Catholic culture of Latin America, by studying the surrounding social and political context and by examining the lyrics and performance practices of the nueva canción from a theological perspective, I will interpret how Catholic theologies and liturgical practices affected the reception of this unique genre.

**Chamber Music Recital**

College of Arts and Sciences: Music

Performance - Course Project, 201810 MUS 390 10

**PRESENTERS** Caleb Joseph Baron, Andrew Robert Buser, Kara Manteufel Camfield, Elizabeth M Craft, Ian C Denney, Adam Michael Essling, Margaret E Feder, Anna Louise Herrmann, Kaity Marie Jones, John R Kennard, Mariya Josephine Miles-Flynn, Bridget Rose Oleksy, Katlyn E Poulsen, Alexander James Rice, Emily Rose Robinson, Timothy Daniel Schroeder, Shelbi J Wagner

**ADVISORS** Kara Manteufel Camfield, James R McCutcheon, Shelbi J Wagner**LOCATION, TIME** Sears Recital Hall, 10:00-11:00

Student musicians will present a program of chamber music that they have worked on through the course of the semester. All students in the various ensembles have been coached by the Department of Music Faculty in the preparation of their program.

**Art Song Revival: Performances and synthesis of original music by Caleb Baron**

College of Arts and Sciences: Music

Performance - Independent Research

**PRESENTERS** Caleb Joseph Baron, Jack Bartholomew Destephano, Mary Catherine Donovan, Anna Margaret Ford, Alaina Louise Saliba

**ADVISORS** Tobias William Rush**LOCATION, TIME** Sears Recital Hall, 11:00-11:40

Student musicians will perform original music for Voice and Piano by student composer Caleb Baron. The performance will include a presentation by the composer about the processes (such as style, techniques, and influences) used within each piece, cultivating an educational and exciting discussion of modern music in a classical style.

**A Celebration of American Female Composers of the 20th and 21st Centuries**

College of Arts and Sciences: Music

Performance - Course Project, 201810 MUS 202 01

**PRESENTERS** Mariah Joanna Berryman, Mary Catherine Donovan, Connor Patrick Fuhrmann, Megan G Green, Megan Rose Green, Ryu-Kyung Kim, Gabriella Michelle Klotz, Jillian Marie Mitchell, Nathan M Rhodes, Alaina Louise Saliba

**ADVISORS** Ryu-Kyung Kim**LOCATION, TIME** Sears Recital Hall, 12:00-1:00

The University of Dayton Music Performance (MUP) Majors present "A Celebration of American Female Composers of the 20th and 21st Centuries." The presentation will include musical performance of selected works by women composers such as Jeanine Tesori, Libby Larsen, Undine Smith Moore and Lindsey Stirling, and discussion on their impact and legacy in the history of American musical composition. While highlighting significant leaps and bounds across genres, the MUP majors will showcase compositions that have been weaved into common repertoire in musical theatre, classical song literature, instrumental works, and more, giving insight into each composer's personal narrative.

**Department of Music Honors Recital Auditions**

College of Arts and Sciences: Music

Performance - Honors Thesis

**PRESENTERS** Anna Margaret Ford, Connor Patrick Fuhrmann, Graham Mitchell Hardert, Aubrie Nicole Hattendorf, Gabriella Michelle Klotz, John Dylan Newcomb, Christine Elizabeth O'Keefe, Alaina Louise Saliba, Timothy Daniel Schroeder, Elizabeth Mary Turnwald, Caleb George Vanden Eynden, Sarah Christine Whitehouse

**ADVISORS** Tobias William Rush

**LOCATION, TIME** Sears Recital Hall, 1:00-3:00

Each student majoring in music at the University of Dayton performs once every semester at weekly department recitals, where they share their hard work and talent with their faculty and peers. Faculty are invited to score these performances. The twelve highest-scoring student performers are invited to audition for the UD Honors Recital on April 27, 2018. These auditions take place as part of the University's Stander Symposium and are free and open to the public.

### **Student Songwriter Concert: Guitar Students of Jim McCutcheon**

College of Arts and Sciences: Music

Performance - Independent Research

**PRESENTERS** Caleb Joseph Baron, Jessica L Bullock, Drew Michael Gaboury, Wyatt Michael Nagel, Timothy Daniel Schroeder

**ADVISORS** James R McCutcheon

**LOCATION, TIME** Sears Recital Hall, 3:00-4:00

Guitar students of UD Music Department Artist-in-Residence Jim McCutcheon perform their original songs in this juried event.

### **The Stigma of Homelessness as an Identity - Homelessness as a Gendered Condition**

College of Arts and Sciences: Philosophy

Poster - Honors Thesis

**PRESENTERS** Jamie Anne Vieson

**ADVISORS** Denise D James

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The main goal of my thesis is to articulate the problem of homelessness. In order to do this, I examine philosopher Eva Kittay's work on disability and equality. Throughout her work, Kittay uses the terms human interconnectedness, oppression and citizenship. These three terms serve as the major concepts I explore. Human interconnectedness highlights the links that humans share with one another as interdependent beings. Sharing these connections provides grounding for why care needs to be available for individuals and groups. Oppression is the term used to describe how certain individuals or groups in society are treated unequally or are rejected from society. I argue that individuals experiencing homelessness should be classified as a group because they do experience structural oppression in the form of marginalization. Finally, exploration of citizenship shows the importance of identities in society and how they allow or prevent equality. Rethinking citizenship combats oppression of the homeless. More emphasis needs to be put on these terms to articulate the problem of homelessness. Within each of these terms, I look more closely at notions of dependency, vulnerability, connection-based equality, self-perceptions, and moral responsibilities. These considerations use gender as a lens for an inclusive examination of homelessness. This lens reveals how women experiencing homelessness are particularly disadvantaged by stigmas.

### **An Analysis of Authentic Existence Online**

College of Arts and Sciences: Philosophy

Oral Presentation - Honors Thesis

**PRESENTERS** Alia Francesca Whitney

**ADVISORS** Steve Bein

**LOCATION, TIME** Kennedy Union 331, 11:00-11:20

When taken as a whole, one's authentic existence would necessarily include considerations of one's "being" online. In *Being and Time*, Martin Heidegger explores what it means to have embodied presence at the phenomenological level, concluding that one's existence is an activity of being-there performed by every human being through circumspect interaction with the world and society that surrounds it. Although he did discuss the impact of technology on a human being, Heidegger lived before the advent of the internet and was therefore unable to include its implications in his work. I discuss the implications the internet has for digital being using Heidegger's ideas, taking it a step further by discussing the digital world's impact on co-presence by drawing on Watsuji Tetsuro's responses to Heidegger in *Rinrigaku*. Watsuji zeros in on one's relationship to society, arguing that one simultaneously exists in union and separation with others and pushes on Heidegger's conceptualizations of the individual's existential process. With both Watsuji and Heidegger's arguments in mind, I argue that one fools oneself into a false sense of authenticity in being online. While authentic existence online is not impossible, it is easy to create an online presence that is composed of inauthentic being. I discuss this idea, relating the implications that follow to embodied presence.

### **Implementation of Passive Solar Energy and Reclaimed Heat from Manure Decomposition for Livestock Water-heating Applications**

College of Arts and Sciences: Physics

Poster - Honors Thesis

**PRESENTERS** Naomi Elizabeth Schalle

**ADVISORS** Robert J Brecha, Annie Warmke (Blue Rock Station, LLC)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Manure is an abundant and renewable resource for livestock farmers that often goes unused. As manure breaks down, heat is released into the environment. When looking at this heat dissipation through the lens of sustainability, there is an opportunity to save energy by capturing the heat in manure decomposition and using it where it is needed. This research capitalizes on that opportunity to develop a way to heat water for livestock in the winter. Using a combination of passive solar energy and the natural heat produced through the decomposition of manure, a system has been designed and implemented to offer a low-cost, sustainable solution that combines mechanical engineering with an agricultural application. Further research and development will be completed for partial- to full-automation of the system.

### **Temperature dependent refractive index measurements for gallium nitride with implications for phase matched and quasi-phase matched optical frequency conversion devices**

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** Jack David Kunkel

**ADVISORS** Said Elhamri, D. Zelmon (WPAFB Research Laboratory)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Gallium nitride is a valuable material for optical and electronic applications due to its wide band gap and high thermal conductivity. Gallium nitride has the potential for being a valuable material in frequency conversion devices such as frequency doublers and optical parametric oscillators. Optical and mechanical characterization of gallium nitride, including the dependence of the refractive index on wavelength and temperature, is important for predicting the performance of devices using this material. The method of minimum deviation was used to measure the refractive index for wavelengths ranging from 0.400 to 5.20 microns and in temperatures ranging from 20 to 225°C. Results of this characterization will be presented along with calculations relating to phase matching and quasi-phase matching in optical parametric oscillators.

### **Epitaxial titanium nitride on sapphire: Effects of substrate temperature on microstructure and optical properties**

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** Hadley Anna Smith

**ADDITIONAL AUTHORS** K.G.Eyink, L.Grazulis, M.J.Hill, A.M.Urbas, B.M.Howe, A.N.Reed (WPAFB Research Laboratory)

**ADVISORS** Said Elhamri

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Titanium Nitride (TiN) is a mechanically-robust, high-temperature stable, metallic material receiving considerable attention for resilient plasmonics. In this work, we fabricated six hetero-epitaxial TiN films on sapphire using controllably unbalanced reactive magnetron sputtering. We examined the effect of substrate growth temperature on the plasmonic and crystalline quality of the film. Optical properties of all films were obtained from spectroscopic ellipsometry; plasmonic quality factors were determined from the real and imaginary parts of the dielectric function. We determined crystallinity using X-ray diffraction and surface morphology using atomic force microscopy. X-ray diffraction showed (111) TiN peaks with Pendellösung fringes indicating consistent hetero-epitaxy. Atomic force microscopy showed smooth surfaces with RMS surface roughness ranging from 0.2-2.6 nm. Based on this characterization, we determined that the substrate deposition temperature of 550°C yielded (111)-oriented hetero-epitaxial TiN with minimal surface roughness. We found that 550°C also gave highest plasmonic quality factors for all wavelengths, approaching the values of today's best plasmonic materials (such as Au and Ag). Further, the Q-factors at wavelength 1550 nm inversely correlated with calculated lattice constants indicating stoichiometric tuning of plasmonic properties. Our results indicate that the plasmonic response of TiN is directly linked with structural quality and stoichiometry of the film.

### **Piezo-optic coefficient of gallium nitride**

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** William Bradley Poston

**ADVISORS** Said Elhamri, D. Zelmon (WPAFB Research Laboratory)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Gallium nitride is a material of interest for a range of optical and optoelectronic applications, including its use in blue light LEDs, efficient solar cells, and high power optoelectronic devices for communications, radar, and power amplifiers. During high power operation, these devices develop temperature gradients which cause changes in the local refractive index due in part to the piezo optic effect, resulting in distortion of the output beam. Therefore, measurement of the piezo-optic coefficients is required to predict the performance of high power optoelectronic devices. Uniaxial mechanical stress was applied to a sample of gallium nitride, which

induced a birefringence in the sample. The magnitude of the induced birefringence was determined by shining polarized light from a HeNe laser through the sample at pressures between .5 and 10 MPa, passing the output beam through a rotating polarizer and measuring the intensity as a function of relative polarizer position. From the induced birefringence, the piezo-optic coefficient of gallium nitride was determined.

## The Self-healing of Distorted Bessel Beams

College of Arts and Sciences: Physics

Poster - Capstone Project

**PRESENTERS** Marie Solange Tumusange

**ADVISORS** Andy Chinyu Chong

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

An optical beam is said to be self-healing when, distorted by an obstacle, the beam corrects itself upon propagation. A Bessel beam is known for its self-healing property. A Bessel beam is a non-diffracting light beam whose amplitude is described by a Bessel function. To demonstrate the self-healing of the Bessel beam, the beam is distorted and beam profiles are measured as the distorted beam propagates.

## Crystallinity and Surface Morphology of Reactively Magnetron Sputtered Aluminum Scandium Nitride

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** Rachel L Adams

**ADDITIONAL AUTHORS** Z.J.Biegler, K.G.Eyink, L.Grazulis, M.J.Hill, B.M.Howe, A.N. Reed (WPAFB Research Laboratory); H.A.Smith (University of Dayton, Physics)

**ADVISORS** Said Elhamri

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Aluminum nitride (AlN) is a low-loss piezoelectric that is commonly used in surface acoustic wave (SAW) and bulk acoustic wave (BAW) based filters for RF communication applications. It has previously been demonstrated that alloying AlN with scandium nitride (ScN) results in an increase of the piezoelectric coefficient up to five times greater than that of pure AlN without significantly increasing losses. This result could have significant impact on next-generation RF-filters. In order for this material to be incorporated into devices, a more thorough understanding of its growth, structural, electrical, and piezoelectric properties is needed. In this work, we investigate the role of deposition parameters during controllable-unbalanced reactive magnetron sputtering on the crystallinity, surface morphology, and composition of aluminum scandium nitride ( $\text{Al}_x\text{Sc}_{1-x}\text{N}$ ) on (0001)-oriented sapphire substrates. The conditions considered in this study include the sputter power, the nitrogen gas fraction, the gas ion flux to metal neutral flux ratio ( $i_i/i_{\text{Me}}$ ) controlled by the coil current on an external electro-magnet, the substrate temperature, and the sputtering target Al-to-Sc ratio. X-ray photoelectron spectroscopy was used to determine the Al, Sc, and N concentrations in the films. X-ray diffraction of the films showed that the crystallinity was dependent upon  $i_i/i_{\text{Me}}$  and substrate temperature. The surface morphology, determined using atomic force microscopy, showed a similar dependence.

## Fabricate nanogap-rich plasmonic nanostructures through an optothermal surface bubble in a nanoliter droplet

College of Arts and Sciences: Physics

Oral Presentation - Graduate Research

**PRESENTERS** Farzia Karim

**ADVISORS** Chenglong Zhao

**LOCATION, TIME** Fitz Hall 580, 1:00-1:20

This project focuses on the development of a rapid and cost-effective method for the fabrication of nanogap-rich plasmonic nanostructures. Novel metal plasmonic nanostructures have been studied extensively due to a wide range of practical applications especially in biology and medicine. Strong coupling between the free electrons in plasmonic nanostructures and incoming light; the so-called plasmonic resonance provides a large electromagnetic field enhancement. Further field enhancement can be carried out through the combination of individual plasmonic nanostructures. This will increase the electromagnetic coupling in the gaps of nanostructures and form a nanogap rich plasmonic nanostructure. However, most of these nanostructures are fabricated through time-consuming top-down nanofabrication or bottom-up synthesis process which cannot provide the requirement for a cost-effective and rapid preparation of nanogap-rich plasmonic nanostructures. Moreover, a special absorptive layer is required to form these structures, which restrict the substrates type. In this project, an affordable nano-manufacturing method has been executed to rapidly prepare nano-gap rich plasmonic nanostructures at any desired location on a substrate. This method works based on laser-induced heating of gold nanoparticles (GNPs) and uses Marangoni convective flow around an optothermal surface bubble inside a nanoliter droplet. GNPs act here as efficient nano-heating source and used as the building blocks for the rapid fabrication of closely-packed GNPs under ambient conditions. So, no special absorptive layer is required which overcomes the limitation on the type of substrate. Moreover, GNPs are confined in a droplet of nano-liter size that can significantly reduce the consumption as well as contamination of sample and confines the liquid flow. This method will enable a broad range of applications such as bio-sensing,

surface-enhanced Raman spectroscopy (SERS), environmental analysis, and nonlinear optics.

### **Nondestructive Approach for Additive Nanomanufacturing of Metallic Nanostructures in the Air**

College of Arts and Sciences: Physics

Oral Presentation - Graduate Research

**PRESENTERS** Md Shah Alam

**ADVISORS** Chenglong Zhao

**LOCATION, TIME** Fitz Hall 580, 2:30-2:50

In this project, a mechanism for quick release and transfer of gold nanoparticles (GNPs) from a soft substrate to another substrate under laser illumination is investigated. The heating of GNPs on a soft substrate with a continuous-wave laser causes a rapid thermal expansion of the substrate, which can be used to selectively release and place GNPs onto another surface. In-plane and out-of-plane nanostructures are successfully fabricated using this method. This rapid release-and-place process can be used for additive nonmanufacturing of metallic nanostructures under ambient conditions, which paves a way for affordable nanomanufacturing and enables a wide variety of applications in nanophotonics, ultrasensitive sensing, and nonlinear plasmonics.

### **Generation of Octave Spanning Spectra directly from a Fiber Oscillator with Self-Similar Pulse Evolution**

College of Arts and Sciences: Physics

Poster - Graduate Research, Chunyang Ma (Visiting scholar at UD from Jilin University, Jilin Province, China)

**PRESENTERS** Ankita Nayankumar Khanolkar

**ADVISORS** Andy Chinyu Chong

**LOCATION, TIME** Fitz Hall 580, 2:50-3:10

The shortest light pulse that can be generated by a mode-locked laser will always be of fundamental interest to the field of ultrafast science. Mode-locked lasers that produce octave-spanning spectra and few-cycle pulses are very attractive for applications such as frequency comb, high-harmonic generation, and ultrafast spectroscopy. Ti: sapphire lasers still dominate the few cycle regimes with generation of 5 fs pulses and octave spanning spectra directly from laser cavity. Performance of the fiber lasers is improved over the years, but they still lag in terms of high energy and few cycle pulses compared to solid state lasers. We have simulated a mode-locked fiber laser design based on the double clad ytterbium doped fiber with the addition of a dispersive delay line (DDL) before photonic crystal fiber (PCF) and it produced octave spanning spectra extending from 750 nm to 1600 nm (660 nm at -20 dB level). It is scientifically important to realize and stabilize a mode-locked fiber laser with such an extreme perturbation even numerically. To our best knowledge, this is the first numerical evidence demonstrating generation of very broad spectra directly out of a mode-locked fiber laser. Further experimental investigation of this mode-locked fiber laser is currently underway.

### **Studying Political Behavior: How the Internet has Expanded Activism for College Students**

College of Arts and Sciences: Political Science

Oral Presentation - Course Project, 201780 POL 311 01

**PRESENTERS** Katherine Rachel Liming, Naimeh Osama Saleh

**ADVISORS** Christopher J Devine

**LOCATION, TIME** Kennedy Union 312, 10:30-10:50

During the aftermath of Election 2016, researchers gained an interest in how social media influenced candidate popularity and how activists were using these tools to organize and mobilize potential voters. In this presentation, we will utilize the tools of surveys and in-depth interviews to study public opinion and political behavior amongst University of Dayton college students. Our objective is to explain how students are using their social media platforms to engage with other people's opinions and develop their knowledge of political issues. Do college students use online tools to take political action instead of in-person action? Do social media feeds influence more online action amongst students? As candidates increasingly turn towards social media to garner votes, college students may be the key to understanding the relationship between social media and American politics today.

### **Rights and Security – Implications of Changing Power Relations**

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Caitlin M Acevedo, Zachary T Brasch, Andrew Thomas Caldwell, Matthew Patrick Clifford, Christian Anton Matico

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 11:00-12:00

Through the discussion of five case studies, this panel will address the role of the United Nations in mitigating the human rights and security implications of changing power relations at the national and international level.

## The International Committee of the Red Cross: Managing the Principles of Impartiality and Neutrality in an Increasingly Public, Media-hungry, World

College of Arts and Sciences: Political Science

Oral Presentation - Honors Thesis

**PRESENTERS** Mercedes Cecelia Ramsey

**ADVISORS** Joel Richard Pruce

**LOCATION, TIME** Kennedy Union 311, 11:30-11:50

One of the oldest humanitarian non-governmental organizations (NGOs), the International Committee of the Red Cross (ICRC) has long been a cornerstone around which all other humanitarian NGOs are built. The ICRC conforms to strict principles regarding their behavior and practices so that they can provide aid to those who need it around the globe. As NGOs began using both traditional and social media to their advantage to promote certain causes, the media and public began to push back, pressuring humanitarian NGOs to adopt some causes or speak out on others. Through studying the ICRC missions during the Nigerian Civil War in the late 1960's and the early 1970's as well as the current war in Syria, this research project intends to answer the following question: How has the ICRC's response to media pressures shifted the perception of humanitarian impartiality and neutrality for both NGOs and the public?

## Rights in Jeopardy – Responses to Security Concerns

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Tania Malaika Boh, Anna Julia Cribbin, Joshua Thomas Dalidowicz, Justin Kyle Dejesus, Trent E Jones

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 12:00-1:00

This panel will address the role of the United Nations in resolving national and international crises, through the discussion of five case studies of crises wherein human rights are in jeopardy.

## Environmental Crises – Impact on Human Rights and Security

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Connor Wray Boyle, Joanna Waltraud Gisel, Clare M Manion, Betsy R Mazza, Austin Wishart Jordan Wishart

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 1:00-2:00

Through the discussion of five case studies, this panel will confer on the role of the United Nations in addressing environmental concerns and crises, and the resulting impact of these predicaments on human rights and security.

## Locating Human Rights in Dayton, Ohio: Stories of Global Ideas in Local Context

College of Arts and Sciences: Political Science

Visual Arts Exhibition - Course Project, 201810 POL 431 P4

**PRESENTERS** Taylor Lee Alexander, Mayra Arlet Baeza, Jessica Nicole Bien, Tania Malaika Boh, Jessica Rose Burnham, Allison Charlotte Burns, Rachel Elizabeth Carr, Emma E Coning, Alex Luck Curtin, Annie Ellis Denten, Rose Eileen Dyar, Claudia Grace Ferguson, Hannah B Gahimer, Maia Ann George, Isabel Cristina Gerardino, Maria Rosario Gordon, Alexandria Erin Graig-Tiso, Emily Kelly Griffin, Veronica Renee Halfacre, Julianne Elizabeth Kalec, Kayla Elizabeth Kingston, Maddie Rose Kurlandski, Chloe Elizabeth Massie-Costales, Mary E McLoughlin, Elyse Marie McMahon, Joe B Mondri, Anna M Mumma, Kerri Nicholson, Taylor Christine Orr, Maura M Parker, Corrie A Pfeiffer, Jade Alicia Poa, Joel Richard Pruce, Brittany Nicole Resar, Rose Quinn Reynolds, Claire Michelle Rotter, Shannon K Roy, Josh Aron Segalewitz, Cong Shao, Thomas William Singel, Jennifer Ann Sobnosky, Sylvia Stahl Marie Stahl, Elizabeth G Strati, Taylor Kate Tovey, Destiny Watson, Zach Shawn Weigel

**ADVISORS** Natalie F Hudson, Glenna Marie Jennings, Joel Richard Pruce

**LOCATION, TIME** Roesch Library Collab Space, 1:00-3:00

"Human rights" is a global vocabulary used to describe the experience of marginalization and suffering. Communities facing violence or discrimination utilize human rights discourse to articulate claims for accountability, as a way to ask for help or demand a remedy. Because of the way in which human rights are documented in international law, "human rights" is endowed with a degree of authority and legitimacy that makes it an appealing framework for those seeking recognition. But, what does "human rights" mean in Dayton, Ohio? Does it inform social justice work in this context? Has the language trickled down from the global to the local? Does human rights have roots or origins that are actually closer to home? Does it resonate with individuals engaged in efforts to protect human dignity in our own backyard? If so, why? If not, why not? What can we learn about the power, as well as the limits, of human rights by investigating how it takes form in the practices of those committed to promote equal respect for all people? The purpose of this project is to examine the existence and meaning of human rights in local advocacy. To initiate this investigation, student teams identified individuals and/or organizations active in the city of Dayton working in a field or on an issue that addresses human welfare. Team members conducted interviews and took photographs of their subjects, and created a multimedia presentation,

illuminating the backstory and the work of those individuals seeking to make a difference in the lives of people in Dayton. The question of human rights animates the project by providing a context within which to analyze and understand the work of local actors.

### **Political Science Senior Capstone: Battleground States and Presidential Elections**

College of Arts and Sciences: Political Science

Oral Presentation - Course Project, 201810 POL 499 01

**PRESENTERS** Brian P Callahan, Hayley Jean Clark, Nicholas Scott Hagenkord, Chase Sterling Hite, James Russell Lee, Matthew Madden, Laura Elizabeth Martine, Nancy A Miller, Haley Erin Naughton, Will Joseph O'Shea, Leo James Schenk, Claire Elizabeth Schmig, Sydney Skidmore

**ADVISORS** Daniel R Birdsong, Christopher J Devine, Nancy A Miller

**LOCATION, TIME** Kennedy Union 311, 1:30-3:00

Students in POL 499 assisted Dr. Daniel Birdsong and Dr. Christopher Devine with their research on presidential campaign battleground states. As part of the political science capstone requirements, the students, in groups, identified their own research question about battleground states and presidential campaigns. They collected relevant data and analyzed that data to address their questions. The results are presented in this session.

### **Promotion of Human Rights – Women, Education, and Persons with Disabilities**

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Darius Jamal Beckham, Thomas Cyrus Goffas, Charlie Michael Homan, Sabrina Assunta Rita Jemail, Carlos Martin Rodriguez, Erin Mary Winchester

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 2:00-3:00

This panel will address the role of the United Nations in promoting human rights, with focus on the rights of women, the right to education, and the rights of persons with disabilities, through the discussion of six case studies.

### **The Enhancement of Saudi Soft Power Under the Vision 2030**

College of Arts and Sciences: Political Science

Poster - Capstone Project

**PRESENTERS** Amal M Alrasheed

**ADVISORS** Jaro M Bilocerkowycz

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Kingdom of Saudi Arabia is undertaking a revolutionary political and socio-economic transformation. Saudi Arabia adopted the vision 2030 program in 2016, and these reforms are receiving a great deal of attention from analysts and international experts, given the scope and depth of the transformation and its impact on the Saudi economy and society. Many scholars have focused on the economic aspects of the vision, but have left out the political and social aspects. This research focuses on how the reforms are going to impact the Saudi Arabia's Soft power? Moreover, the research covers diverse questions about the emergence of the vision, how is it going to be implemented, and what are the domestic and international perspectives on this vision of the future of Saudi Arabia?

### **Health Policy Responses and Infrastructure Re-Use in Host Cities of Mega-Sporting Events in Non-Traditional Host Countries**

College of Arts and Sciences: Political Science

Poster - Honors Thesis

**PRESENTERS** Andrew M Kramer

**ADVISORS** Joshua D Ambrosius

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Many people and event organizers have lobbied for the allocation of Olympic sites to non-traditional sites by marketing them as a transformational event for the country's economy and infrastructure. We study the efforts of three case studies: the 2016 Summer Olympics in Rio de Janeiro, the 2014 Winter Olympics in Sochi, Russia, and the 2010 World Cup in Johannesburg, South Africa. By inspecting health policy responses and urban infrastructure re-use projects, this thesis research contributes to the understanding of the impact of hosting mega-sporting events for communities in host cities. We specifically connect the impact of hosting a sporting event for the best athletes in the world—often models of health for audiences—has on the health of its community members.

### **Do Normative and Pathological Personality Traits Overlap? A Conjoint Confirmatory Factor Analysis of the NEO-PI-3 and PID-5**

College of Arts and Sciences: Psychology

Poster - Honors Thesis



**PRESENTERS** Lisa Eileen Stone

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Historically, personality disorders have been conceptualized as qualitatively distinct clinical syndromes, based on operational criteria. Consistent with this model, ten distinct set personality disorder criteria are outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013). However, debate persists about the clinical utility of this categorical model, with many (Krueger, et al.) researchers supporting a dimensional model that focuses on pathological levels of normative personality traits. A recent exploratory factor analysis (De Fruyt et al., 2013) of the NEO Personality Inventory-3 (NEO-PI-3; Costa & McCrae, 2010) and The Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012), suggests that normative and pathological personality traits may fall under the same common set of domains: negative affectivity-neuroticism, extraversion-detachment, openness-psychoticism, antagonism-agreeableness, and conscientious-disinhibition. However, a confirmatory factor analysis (CFA) of this model has yet to be conducted. The purpose of this study is to further explore the relationship between normative and pathological personality traits and to test the De Fruyt et al. model by conducting a conjoint CFA of the NEO-PI-3 and PID-5. It is hypothesized that the PID-5 and NEO-PI-3 share the same underlying factor structure. Using mPlus, the model will be tested in separate samples of 300 undergraduate students at a private Midwestern university and 200 adults (> 18 years of age) from the surrounding Dayton community. Understanding the relationship between these two measures is important, as they are consistently used to diagnose and aid in treatment of individuals with personality disorders.

## **The Effects of Adolescent Housing Condition and Voluntary Exercise on Alcohol Intake and Stress Response in Male Long-Evans Rats**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Caroline A Lynch

**ADVISORS** Tracy R Butler

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Can regular exercise during adolescence, combined with living in a social environment, decrease both the negative effects of chronic stress and alcohol intake later in life? The aim of this research is to answer this question using a rat model that introduces a novel behavioral intervention in the form of regular voluntary exercise in order to counteract the negative effects of chronic stress caused by socially-isolated housing during adolescence. Chronic stress has been linked to the development of alcohol use disorders (AUDs) in humans, and this study attempts to both model and hamper this phenomenon in rats using voluntary exercise. Gaining an understanding of how housing conditions and exercise can play a role in subsequent alcohol intake and stress hormone levels may be useful for the advent of new pharmacotherapies for individuals with an AUD.

## **Perceptions of Violence**

College of Arts and Sciences: Psychology

Poster - Capstone Project

**PRESENTERS** Abigail Pauline McIntyre

**ADVISORS** Dario Norman Rodriguez

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

System justification theory suggests that people tend to view authority figures as credible and dependable (Jost, Tyler, & Van der Toorn 2011). Individuals also tend to hold those who commit unsanctioned violence or exhibit criminal behavior in disdain. This study was designed to examine how these tendencies relate to people's perceptions of situations involving authority figures, vigilantism and violence. Two hypotheses were tested: that the victim of such an interrogation will be viewed less favorably and the attacker more favorably in cases where a low status victim is interrogated by an off-duty police officer, and that the victim will be viewed more favorably and the attacker less favorably in cases where a high status victim is interrogated by a vigilante. Participants' evaluations of characteristics of aggression, credibility, criminality and guilt were measured as they applied to police officers, vigilantes and suspected criminals.

## **Physiological and Psychological Effects of Being Weighed in Female Participants**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Julia Christine Carroccio

**ADVISORS** Jacob M Burmeister, Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Stressful experiences such as constantly thinking about one's weight lead to harmful long-term physiological and psychological effects on the body. Many studies have examined the presence of weight stigma in society at large, but fewer studies have sought to determine the physical and psychological outcomes of that stigma. In the short-term, even momentary stressors could have an impact on factors such as blood pressure, for example when patients are stressed due to weighing before blood pressure is measured. This study tested whether female participants' (N = 55) attitudes about their bodies, anxiety levels, and blood pressures were

affected by being weighed. The participants were 55 female undergraduate students from the University of Dayton who were enrolled in introductory psychology courses, or some other course that required research participation. It was hypothesized that being weighed would produce negative outcomes on measures of blood pressure, body satisfaction, self-esteem, and anxiety. Results of a one-way ANOVA indicated that these factors did not differ for participants who were weighed just prior to measurement compared to those who were weighed after. Thus there may be some limits to “white coat syndrome,” which is the phenomenon of a patient having higher blood pressure readings when in the presence of a physician or other medical staff. Factors such as the setting and demographic of the person obtaining the measures could be relevant.

## **Alcohol Deprivation Effect: An Investigation of a Model of Alcohol Dependence and Relapse Behaviors in Male and Female Long Evans Rats**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Hanna Jane Peterson

**ADVISORS** Tracy R Butler

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Humans that become addicted to alcohol and other drugs often relapse even long after becoming abstinent especially when they encounter stressors in life. Stress that a healthy person handles with coping mechanisms like exercise or talking to a friend, an addict may handle by resuming use of their drug of choice. People may also relapse if they re-enter an environment where they used the drug because of a learned association between that environment and the good feeling of the drug. In order to understand relapse behavior, a pre-clinical rodent model of relapse is used which models the important aspects of the human addiction and relapse condition. While a rodent model does not replicate every aspect of the human condition, it can model the aspects that are most important in addiction and relapse overall. The model used in this study is the alcohol deprivation effect (ADE) model. It has been found to model alcohol addiction and relapse in rats and can therefore allow for further understanding of relapse behavior as well as allow for testing of the effects of various variables like stress or therapeutic drugs on relapse behavior. However, before these further tests can be done, it must be clear that the model works in the Long Evans rats that are used in the lab. I am also interested in whether the ADE model yields similar results in male and female rats. This project will investigate the usefulness of the ADE model in Long Evans male and female rats by replicating a similar study done previously by Sinclair and Tiihonen (1988).

## **Chronic administration of probiotic *L. rhamnosus* increases anxiety-like behavior in group-housed male Long Evans rats**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Parker Maddison Griff

**ADVISORS** Tracy R Butler, Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Early life stress is a risk factor for later development of alcohol use disorders and anxiety disorders in humans. Using rodent experimental models, we know that rats experiencing social isolation as early-life stress exhibit greater anxiety-like behavior and alcohol consumption than rats housed in groups. Examining potential preventive strategies, we investigated the effects of probiotics, which have previously been shown to decrease rodent anxiety-like behavior, on the relationship between early-life stress and anxiety-like behavior in rats. We hypothesized that probiotics consumption would decrease anxiety-like behavior in socially isolated rats, as well as in rats housed in groups. To our surprise, we found that the probiotics had no significant effect on anxiety-like behavior for socially isolated rats but significantly increased anxiety-like behavior in rats housed in groups. Our results suggest probiotics do not have a positive benefit to alleviate consequences of early life stress and raise caution for their therapeutic use.

## **Olfaction and Disgust as predictors of Elevated Perfectionism**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Maia A McLin

**ADVISORS** Julie Walsh Messenger

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Olfaction aided in survival by providing a means to assess if foods were safe to consume. This assessment may have increased chance of survival by decreasing the likelihood of consuming contaminated foods leading to an evolutionary advantage (Rozin & Fallon, 1987). Disgust and olfaction are not key in survival today because of current regulations that prevent the distribution of spoiled and contaminated foods. It is possible that disgust sensitivity and the perception of normally perceived pleasant odors as unpleasant act as a disadvantage in those diagnosed with obsessive-compulsive disorder and obsessive-compulsive personality disorder. This study will examine associations between rigid perfectionism, odor detection sensitivity, perceived pleasantness of odors and disgust sensitivity. Approximately 80 undergraduate students from the University of Dayton will be assessed for odor detection sensitivity, odor identification accuracy, and complete three self-report questionnaires assessing personality traits and disgust sensitivity. Odor sensitivity will be tested with Sniffin Sticks Odor Detection Threshold test (Burghart Instruments; Hummel, Sekinger, Wolf, Pauli, & Kobal, 1997), perceived odor pleasantness with Sticks odor identification test (Burghart Instruments; Hummel et al.,

1997). The three self-report measures used are the NEO Personality Inventory-3 (NEO-PI-3; McCrae, Costa & Martin, 2005), the Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012), and the Disgust Scale-Revised (Haidt, Mccauley & Rozin, 1994). It is predicted that elevated perfectionism will be associated with lower odor detection sensitivity, lower pleasantness, higher disgust scores, and higher neuroticism. This study may provide further understanding of relationships between perfectionism, disgust and olfaction, and may also help identify possible target areas for Obsessive Compulsive Personality Disorder treatment by changing odor perceptions.

## **How Academic and Extracurricular Workload affects Stress Levels, and Consequently Mental and Physical Health of College Students**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Aidan Paul Koch

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Academic workload and extracurricular involvement can be sources of stress for college students. Academic workload is characterized as the student's major, course work and future graduate school and/or career path plans. Extracurricular involvement can pertain from anything to intramural sports to being the President of a student organization. The current research seeks to investigate changes in mental and physical health over a semester by examining physiological stress levels in college students, in conjunction with academic workload and extracurricular involvement. Previous research finds an association between stress and physical health (Peer, Hillman, Van Hoet 2015). Studies have shown sympathetic nervous system activation due to stressors in people's lives (Conley & Lehman, 2012). Mental Health has also been shown to decrease when stress is overwhelming in the lives of college students (Murff, 2005). The goal of the present work is to examine academic workload, extracurricular involvement, physiological stress, and mental and physical health over the course of the semester to better understand how they are associated. Using a longitudinal design, participants will complete measures of mental and physical health, as well as academic workload and extracurricular involvement at the beginning and end of the fall semester. Physiological stress will be assessed at each time point by collecting a saliva sample from participants in order to measure the hormone cortisol.

## **Personality Types and Self-Reported Eating Habits**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Tom Richard Lawler

**ADVISORS** Jacob M Burmeister, Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

People with different personality types lead very different lifestyles; these personality types also affect the eating habits of an individual. Poor eating habits can lead to a myriad of health problems, including obesity and diabetes, while healthy eating habits can promote longevity. An associated problem is inaccurate reporting of eating habits by research participants and medical patients. While many studies have been conducted to examine the relationship between eating disorders and personality types, very few, if any, have examined the effects of personality types on actual eating habits as well as perceived eating habits. The proposed study will test for associations between personality traits and eating habits and inaccuracy in self-reported eating habits. Using the five factor personality model, participants will be given a questionnaire to assess the personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism. Participants will then be given two more questionnaires to determine their actual eating habits and their perceived eating habits. The actual eating habits will be determined using the Self Reported Habit Index, a rigorous eating habit assessment that can accurately determine the habits of an individual. Participants' perceived eating habits will be assessed using a questionnaire designed specifically for this study that will assess their general view of the healthiness of their own eating habits. Participants will be gathered via Amazon's Mechanical Turk. Through analysis of this data, conclusions will be drawn about the susceptibility of various personality traits to detrimental eating habits. Additionally, the discord between perceived and actual eating habits will be determined to provide insight into the attitudes of individuals regarding their own eating habits. This information will equip medical professionals and dieticians with knowledge about how to best accommodate patients with poor eating habits and provide them with top-notch treatment.

## **Urban Gardening Initiative for the Enhancement of Wellness and Environmental Attitudes of Service-Learning Research Assistants: A Participatory Community Action Research Project within Local Homeless Shelters**

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Alicia Michelle Selvey

**ADVISORS** Charles Allan Hunt, Roger N Reeb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homelessness is a complex and pervasive community problem that affects all levels of society. This collaborative Participatory

Community Action Research Project between Dr. Roger N. Reeb (Roesch Endowed Chair in the Social Sciences, Professor of Psychology, University of Dayton) and administrators at St. Vincent de Paul (Dayton, Ohio) implements Behavioral Activation at local homeless shelters as a way to address this pervasive problem within our community. Behavioral Activation, a form of operant conditioning, refers to a therapeutic strategy that attempts to increase overt behaviors by bringing a person into contact with positive response-contingent reinforcement. This enhances positive thinking, mood, quality of life, and the pursuit of personal potential. The project, which began in August of 2013, is implemented at both the Men's Shelter and Women's Shelter and has recruited well over 1,500 residents and served countless more. The project utilizes service-learning pedagogy; community members, faculty, and graduate and undergraduate students contribute to the project in various ways. Based on quantitative findings, shelter residents perceive Behavioral Activation sessions as meaningful, worthy of repeating, and enjoyable. Furthermore, quantitative findings indicate that, as shelter residents participate in the project over time, they perceive Behavioral Activation as contributing to key psycho-social factors as follows: hope, capability and motivation for education or work, purpose or meaning in life, and social/emotional support. Additionally, the project has contributed to creating a healthier social climate within the shelter, as evident by qualitative analyses; the data has revealed important emergent themes (e.g., importance of student-resident relationships in supporting psycho-social improvements). This proposed research involves the establishment of an urban garden within the context of the Behavioral Activation project. In addition to enhancing nutrition for shelter residents, this research will examine pre-to- post semester outcomes (wellbeing, environmental attitudes and behavior) for service-learning students who implement the urban gardening initiative.

### **The Other Woman: Women's Tendencies to and Perceptions of Mate Poaching Across the Menstrual Cycle**

College of Arts and Sciences: Psychology

Stander Undergraduate Fellowship Awardee

Poster - Honors Thesis

**PRESENTERS** Margaret Marie Jaeger

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Mate poaching, or romantically pursuing an individual already in a committed romantic relationship, is a potentially hazardous mating tactic for women, as it opens them up to retaliation from scorned women. Because of this danger, from an evolutionary perspective, mate poaching would be most valuable to a woman when she would benefit most from the poached partner in the form of offspring, or when a woman's conception risk is at its highest. Research in the field strongly suggests that women who are partnered to genetically desirable men are wary of ovulating women because of their tendency to mate-poach. The present work examines this relationship more closely. The first experiment examined if women were in fact more likely to mate poach when they are ovulating as opposed to when they are not. The second experiment examined how women perceive other, ovulating women that they imagine are interacting with their significant other.

### **An Investigation into Bullying and Cyberbullying: The Effects of Anonymity and Form of Bullying on Severity of Victim Impact**

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Ashley Marie Harrison

**ADVISORS** Jackson A Goodnight

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Bullying has been a problem for many years, but due to the development of electronic communication, cyberbullying in particular has recently become a widespread problem (Boulton, Hardcastle, Down, Fowles, & Simmonds, 2014). Research suggests that cyberbullying may have a greater negative impact for victims than traditional bullying (Gilroy, 2013; Walker, Sockman, & Koehen, 2011). Previous research suggests that cyberbullying may cause impaired mental health and psychological distress and may increase risk factors for suicide among college students (Zalaquett & Chatters, 2014). Research also suggests that when the victims do not know the identity of a perpetrator, it decreases the perceived control the victim has over the bullying situation (Sticca & Parren, 2013). It was hypothesized that cyberbullying victimization would be associated with greater depression and anxiety than traditional bullying victimization alone, and that higher levels of perpetrator anonymity, reduced control, and increased frequency of victimization would explain, or mediate, this difference. Mediation analyses indicated that a reduction in perceived control significantly mediated the association ( $b = .09$ , 95% CI =  $.006$  to  $.246$ ) between cyberbullying and depression. Mediation analyses also revealed frequency of bullying to significantly mediate the association ( $b = -.08$ , 95% CI =  $-.204$  to  $-.005$ ) between cyberbullying and anxiety. These findings indicate that students who experience cyberbullying in addition to traditional bullying, compared to those only experiencing traditional bullying, experienced higher levels of anxiety and depression owing to a reduction in perceived control and an increase in frequency of victimization. These findings suggest that negative consequences of bullying in college may be mitigated by promoting awareness among students to increase their perceived control. Findings also suggest that risk for depression and anxiety in college may be mitigated by promoting bullying prevention programs to reduce frequency of cyberbullying victimization.

### **Urban Gardening in a Participatory Community Action Research Project at Homeless**

## Shelters: Enhancement of Wellness and Vocational Readiness for Shelter Residents

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Katey M Gibbins

**ADVISORS** Charles Allan Hunt, Roger N Reeb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homelessness is a ubiquitous community problem that exists at the local, national, and international levels. This Participatory Community Action Research Project represents a collaboration between Dr. Roger N. Reeb (Roesch Endowed Chair in the Social Sciences, Professor of Psychology, University of Dayton) and administrators at St. Vincent De Paul (Dayton, OH). This project, which began in August of 2013, implements Behavioral Activation sessions at local men's and women's homeless shelters and well over 1,500 shelter residents have participated in the Behavioral Activation project thus far. Behavioral Activation is based on operant conditioning, refers to a therapeutic strategy that attempts to increase overt prosocial behaviors that bring a person into contact with reinforcing environmental opportunities, and thereby enhances thoughts, mood, quality of life, and actualization of inherent potentialities. This project also utilizes service-learning pedagogy, with faculty, community partners, graduate students, and undergraduate students working together to implement Behavioral Activation sessions within the shelters. Quantitative findings, which have been presented at numerous conferences, indicate that shelter residents perceive individual Behavioral Activation sessions as meaningful, worthy of repeating, and enjoyable. Over time, quantitative findings also indicate that participants perceive the Behavioral Activation Project as contributing to their sense of hope, capability and motivation for education/work, purpose or meaning in life, well-being, quality of life, social/emotional support, and improved social climate. Qualitative data support these quantitative findings and also reveal important themes (e.g., importance of student-resident relationships in supporting psychosocial improvements). This proposed research involves the establishment of an urban garden within the context of this project. In addition to yielding produce to enhance nutrition for shelter residents, this research will examine pre-to-post improvements in wellbeing in shelter residents who participate in the farming initiative.

## Smelling How to Feel: Does Ambient Odor Affect How We Evaluate and Recall Emotional Stimuli?

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Michael Alexander Lee

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Olfaction, or the sense of smell, is a ubiquitous element of the human experience. Odors are all around us and can arouse a wide range of feelings or even stir vivid memories. While studies have found that odor can influence people's evaluation of various types of stimuli, no study has shown how odor can influence how people rate the emotional content of visual stimuli, nor has it been shown how it might affect our ability to recall such stimuli. Odor's ability to affect how we evaluate and recall emotionally-charged stimuli could carry deep implications for how olfaction impacts our daily lives. This study seeks to examine how odors that carry different hedonic values affect how participants rate and recall emotionally-charged visual stimuli. Prior to the study, participants will complete an online survey where they rate the emotional valence of a collection of images from the International Affective Picture System (IAPS), which will be evenly divided between positive, negative, and neutral valence. The initial portion of experimental session will take place in a room in which either a pleasant odor, an unpleasant odor, or no odor will be present. Participants will be presented with a subset of images from the survey and asked to rate them again for valence and arousal. Immediately afterwards, participants will complete a recognition task where they will be presented with a larger collection of images and asked if they recall seeing each image earlier in the session. Finally, participants will be moved to another room without odor, complete roughly 30 minutes of distraction tasks, then complete a delayed recognition task. This task will follow the same procedure as the earlier recognition task, with the additional component of rating each image for arousal and valence. This project is expected to be completed in spring of next year.

## Personality and Health Risk Information Avoidance

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Kelsey Michelle Julian

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

When it comes to personal health risks, some people will choose to avoid information that may be threatening to their beliefs, behaviors, or overall self-image. While many studies have been performed to discover methods that may help to reduce information avoidance, there has been little research regarding the personality characteristics of people who are more likely to engage in information avoidance. The present study will utilize a conceptually similar paradigm from previous research in which participants are led to believe that they will be able to find out whether they are at risk for an illness during their lab experience. Participants will complete personality questionnaires and then will be asked to provide a saliva sample in order to be tested for ostensibly real

predisposition to alcoholism detectable in saliva. Participants will then decide if they would like to get their test results back or not. In addition to examining whether certain personality characteristics are associated with information avoidance, the saliva will be assayed for the stress hormone, cortisol, to examine whether physiological stress is associated with personality and information avoidance.

## The Influence of Self-Esteem and Stress on Academic Performance in College Students

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Angel Joshua Pagan

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The proposed research seeks to examine the association self-esteem, how one perceives their abilities and worthiness in society, on the human stress hormone, cortisol. According to Lazarus & Folkman (1984), stress occurs when perceived environmental demands exceed one's ability to cope with them. The majority of research available pertains to elevated levels of the hormone due to physical, external and internal stressors, but lack in the dimension of investigating self-esteem. The proposed research seeks to expand the body of work regarding the causes of stress and self-esteem on academic performance. Current research states if an individual does not believe he or she is competent, significant or worthy, heightened appraised stress can be expected to occur (Eisenbarth, 2012); therefore, it is hypothesized that an individual who has a perceived low self worth (low self-esteem) will have increased levels of cortisol, leading to lower academic performance. In contrast, individuals with high-perceived self worth (high self-esteem) will have lower levels of cortisol, which will contribute to higher academic performance. The proposed two-part study will use the data collected to find the association between self-esteem and stress, via the steroid hormone cortisol, on the participant's actual academic performance. These findings will be compared to illustrate the correlation between the variables to add to the body of work pertaining to factors that influence academic performance.

## Sex Differences in Concussion-Related Attitudes Among College Students

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Pat William Dwyer

**ADVISORS** Joshua M Ricker, Mark Gordon McCoy (Bowling Green State University)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Every year there are 300,000 – 3.8 million concussions sustained in the United States. Due to the prevalence of this injury and an increased understanding of it that has developed over the past decade, concussions have become a topic of much concern and conversation. Previous research has shown that factors such as having children, socioeconomic status, a person's own concussion history, and amount of time available for education, among many others can influence attitudes and knowledge about concussion. The current study sought out to understand the influence of the sex an individual and college education on multiple concussion-related attitudes. We developed a survey to assess the attitudes of college students on a range of topics surrounding concussions. 200 students at the University of Dayton were surveyed, and from our pre-test data we found significant differences in attitudes on a few questions between sexes. Males were more likely to report a higher opinion of the way professional sports leagues have handled the concussions in general. Also, males were more likely to report that they felt the monetary benefits to playing sports outweighed the risks associated with sustaining a concussion. Finally, females felt more strongly that there should be laws created and enforced in relation to concussion management for youth sports. Our results indicate that sex differences emerge in various areas of concussion-related attitudes.

## Influence of positive illusions and stress on weight gain in college students

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Olivia Grace Grondalski

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

With majority of overweight or obese children growing up to be overweight or obese adults, understanding different influences on eating and exercise at an integral transition period into adulthood is paramount. There are several different influences on physical health from genetics to environmental factors, however, the relationship between self-enhancement and weight gain is largely unstudied. The purpose of this proposed longitudinal study is to understand the influences of positive illusions, in the form of self-enhancement, on changes in weight of college students and the role stress plays in this relationship over time. At the beginning of the semester, students will participate in Time 1, and have their height and weight recorded. Body Mass Index will be calculated using the standard equation of weight in kilograms divided by height-squared in centimeters. Then participants will complete a series of questionnaires on the computer that are relevant to the current proposal. These questionnaires include the body dissatisfaction scale to assess perceived body mass index, and self-reported stress. The Body Dissatisfaction Scale (Mutale, Dumm, Stiller, & Larkin, 2016) will be used to assess how the participant perceives their body. Participants are presented with body size images that vary in size. For each body size presented, the weight and BMI have been calculated. The difference between the participant's actual BMI

and their perceived BMI will be calculated. Self-reported stress will be assessed using the Perceived Stress Scale (Cohen, Kamarck, and Mermelstein, 1983). Actual stress will be measured in the form of cortisol. Cortisol is a steroid hormone secreted by the adrenal glands. It is hypothesized that students with high self-enhancement, and physiological stress will influence weight gain throughout the semester.

## **Caffeine Rush! Examining the Effects of Caffeine on Spatial Working Memory.**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Alexander N Lawriw

**ADVISORS** Susan T Davis

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Caffeine is well-known for its ability to make a person feel more attentive, more alert, and less fatigued, but could this popular stimulant also help improve a person's memory, as well? Prior research suggests that caffeine might be a cognitive enhancer with participants showing improved performance on short-term memory tasks such as the recall of word lists (Arnold et al., 1987; Barraclough & Foreman, 1994; Rogers & DERNONCOURT, 1998; Ryan et al., 2002; Schmitt, 2001a, b). However, conflicting results using similar tasks have called these findings into question. On top of this, the overall body of research concerning caffeine and memory has tended to focus solely on relatively simple assessments of newly established episodic memory, leaving a glaring gap in the literature when it comes to other types of memory (e.g., semantic memory). The present research aims to fill this gap by studying caffeine's potential effects on spatial working memory, the temporary storage, maintenance, and manipulation of spatial information. In the experiment, participants were asked to complete levels of varying difficulty within a computerized version of the popular puzzle game, Rush Hour, after consuming either a 200 mg caffeine pill or a placebo. Rush Hour requires the player to move a designated red 'target' car to the exit of a 6 x 6 grid. Blocking the exit are other cars that can only be moved horizontally or vertically depending on the direction they are facing. Participants must use the spatial information of the grid layout in order to complete the levels as efficiently as possible. We hypothesize that those participants given caffeine will complete these levels quicker and with fewer errors than those given a placebo. However, this increase in performance may be limited on more difficult levels due to increased workload and ensuing stress.

## **Does self-enhancement affect spending behavior? An experimental analysis**

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Mark A Matthews

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This project aims to examine the extent to which self-enhancing, bolstering one's views of oneself, uniquely affects spending behavior. Self-enhancement is associated with both improving self-esteem (Hepper, et al., 2010), well-being (O'Mara et al., 2012), and positive affect (Bonanno et al., 2005), all variables that affect spending well-being (Babin & Attaway, 2000; Yurchisin et al., 2008). Therefore, it is likely that self-enhancing will affect one's spending while shopping, as well as their overall well-being after shopping. Participants will complete measures of their current mood and self-esteem. Participants will then be randomly assigned to one of three conditions. In the self-enhancement condition, participants will think about their most important trait and write about how this trait is more characteristic of them than other college students. In the affect condition, participants will think about recent positive event that occurred in their life and will reconstruct how that event came to be. In the control condition, participants will not perform any task. All participants will then complete measures of mood and self-esteem again, followed by a shopping simulation in which they will be asked to shop for items from the UD bookstore. Last, participants will complete measures of their overall well-being, including measures of mood, stress, anxiety, depression, and satisfaction with life. It is hypothesized that participants in the self-enhancement and the positive affect condition will spend more money and experience higher well-being than participants in the control condition. It is also hypothesized that participants in the self-enhancement condition will spend less money than participants in the affect condition.

## **Participatory Community Action Research in Homeless Shelters: Applications of Behavioral Activation and Service-Learning Pedagogy**

College of Arts and Sciences: Psychology

Panel Discussion - Course Project, 201810 SSC 200 01

**PRESENTERS** Megan Marie Barry, Natalie Jane Bayer, Barbara Holland Bobal, Karla Leigh Borgerding, Ben Scott Breh, Jessica L Bullock, Julia Christine Carroccio, Benton A Carter, Mara Adrian Coffey, Lauren Julia Declark, Anika Shea Desloge, Katherine Ann DiGiandomenico, Justin Willem Dorr, Hannah Payton Dunne, Nathan L Epprecht, Will Fehribach, Marie Hermine Feyche, Katheryn Elizabeth Gerling, Katey M Gibbins, Kathryn Anne Godfrey, Ashley Marie Grassan, Michael Robert Gross, Cassandra L Hartman, Stephanie J Herbst, Lauren Arlene Hoody, Jill Marie Hubert, Amanda Rose Imbrogno, Kelsey Michelle Julian, Becca Frances LeBouef, Mingqing Luo, Jack Jeremiah McCormick, Gabriela Ana Milos, Garrett Stephan Neu, Dylan Anthony Penna-Powell, Isabella Perez, Dana Lynn Pflugrad, Alexander Bonne Posma, Alex Jordan Reynolds, Lucas Charles Sadenwater, Anna Grace Schlegel, Mallory Hope Schrier, Megan Elizabeth Schuman, Tom Gregory Schweikert, Alicia Michelle Selvey, Landis Yuri Soto, Katie Barbara Stumpf, Emma

Rutledge Venetis, Qi Wang, JD Dennis Webb, Joe Reed Weeks, Sara Elizabeth Wetter, Megan Elizabeth White, Tori C White, Lindsey Grace Whittemore, Asher Jacob Williamson, Mallory Rose Zalla, Le Zhang, Bin Zhou, Jennifer Leigh Zicka

**ADVISORS** Greg C Elvers, Charles Allan Hunt, Roger N Reeb

**LOCATION, TIME** Kennedy Union East Ballroom, 1:00-3:00

This transdisciplinary project, guided by the Psycho-Ecological Systems Model (PESM; Reeb & Folger, 2013), implements behavioral activation at homeless shelters, sponsored by St. Vincent de Paul (Dayton, Ohio), for men and women. Utilizing a participatory community-action research strategy with a service-learning pedagogy the project attempts to integrate the undergraduate student population within the greater Dayton community. Rooted in Skinners operant conditioning, behavioral activation is defined “as structured attempts to increase overt behaviors that bring an individual into direct contact with opportunities for response-contingent reinforcement and thereby produce improvements in his or her quality of life, mood, thoughts, and empowerment to recognize and pursue personal potential” (Hopko et al., 2003). Behavioral activation sessions are designed to (1) enhance the shelter guests’ empowerment, (2) strengthen their coping skills/capacity, and (3) improve the social climate of the shelters. Results indicate that guests find behavioral activation sessions to be important, meaningful, worthy of repeating, and enjoyable. Findings also suggest that guests perceive behavioral activation sessions as contributing to their overall levels of hope, mood, empowerment, social support, positive social climate perceptions, purpose/meaning in life, and quality of life. In addition to presenting quantitative and preliminary qualitative results from research on the project, we will discuss a number of extensions of the project to different settings, such as the newly developed Urban Gardening Initiative and continued collaborative partnership with the Montgomery County Office of Reentry. Lastly, student research assistants will be serving as panelists to present and discuss their experiences while working on the project within the greater Dayton area homeless shelters. Specifically, they will be addressing their perceived ability to act as an agent of change within the community, the changes in perception of homelessness and homeless individuals, and their perception of the stigma, oppression, and discrimination faced by homeless individuals.

## Wives’ Perceptions of Husbands’ Housework and Parenting Contributions

College of Arts and Sciences: Psychology

Oral Presentation - Honors Thesis

**PRESENTERS** Reilly Kate Kincaid

**ADVISORS** Catherine Lutz Zois

**LOCATION, TIME** Kennedy Union 312, 1:30-1:50

Compared to the nuclear family in previous decades, today’s typical family is less likely to have only the father working for pay and the mother possessing sole responsibility for the housework and childcare. As women continue to strive toward more equal participation in the paid workforce, many studies have pointed to trends of dual-income families’ redistribution of household labor between spouses. Although husbands may be increasing their housework and childcare contributions, the type of contributions they make tend to be that of a “helpmate,” leaving the responsibility for the organization and management of such labor to their wives. Using a qualitative method, Gordon and Whelan-Berry (2005) found that the majority of husbands spent more time “doing” rather than “managing” in the household. The present study uses a sample of female faculty and staff at the University of Dayton, who are in dual-income marriages and have children, to examine wives’ perceptions of how much their husbands “do” and how much their husbands “manage” in terms of housework and childcare. Participants completed questionnaires to measure their perceptions of how frequently their husbands “do” and “manage” various household and childcare tasks, their initial expectations regarding their husbands’ contributions, and their satisfaction with life and marriage. Results provide quantitative support for Gordon and Whelan-Berry’s high-doing, low-managing husband norm and shed light on the different implications that husbands’ various contributions have for wives’ life and marital satisfaction. Husbands’ ‘doing’ behavior emerges above their ‘managing’ behavior in terms of its importance in predicting satisfaction, suggesting that the “helpmate husband” arrangement is not only tolerated, but perhaps even preferred among some women. The variety of factors perpetuating this trend, and the doing-managing dichotomy more generally, remain unclear and constitute an important area for gender and family research to focus on in future studies.

## The Effects of State Anxiety on Olfactory Function in Healthy Young Adults

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Lauren Taylor Olson

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The specificity of the interaction between the olfactory and emotional systems in the human brain remains unclear due to contradictory research findings. Prior studies have found both positive and negative associations between levels of anxiety and odor detection sensitivity, identification ability, and hedonic ratings. To address this lack of conclusive findings, the present study utilized a within- and between-subjects experimental design to investigate the effects of anxiety induction on olfactory threshold, identification accuracy, and hedonic ratings among 40 undergraduate University of Dayton students. The experimental procedure tested several hypotheses regarding changes in measures from baseline to post-induction: Participants in the anxiety induction group will exhibit a significant decrease in post-induction odor threshold scores, compared to baseline scores, while odor threshold scores will remain stable in the control group. Participants in the anxiety induction group will exhibit a significant increase in their post-induction odor identification accuracy scores, compared to baseline scores, while odor identification accuracy will remain stable in the control group. Participants in the anxiety induction group will rate post-induction neutral odors as significantly more unpleasant



compared to control ratings. Understanding the specific effects of anxiety on olfactory perception is critical in expanding the understanding of reactive emotional processes and may help future researchers who wish to study anxiety and emotional dysfunction in relation to perceptual processes.

## The Persistence of Neotenus Behaviors in *Felis catus*

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Karina H Palermo

**ADVISORS** Greg C Elvers

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

It is hypothesized that as a cat owner's nurturing behavior increases, the cat's neotenus (juvenile) behaviors will increase. Bradshaw, Casey, and Brown (2012) reports the persistence of juvenile behaviors to be one of the three effects that domestication has on *Felis catus*. Though physiological changes are more easy to observe, behavioral changes are more challenging to measure, as they vary cat-by-cat. Moreover, Price (1999) notes that changes in animal behavior are often due to changes in the animals' social environment. The changes from wild to domestic, or even outdoor to indoor living have a large impact on cat behavior. Locke and Prinz (2002) explain that when it comes to parenting, nurturance can be shown through emotional expressions, such as a hug, and instrumental acts, like playing a game together. Participants' behavior towards their cats are measured using these categories. The topic under question is finding correlates of persistent neotenus behaviors in *Felis catus*. Nurturance questionnaires, neotenus behavior checklists, as well as emotional expressions and instrumental acts checklists adapted for the cat and owner relationship have been distributed to patrons of the Gem City Catfé in Dayton, OH. The café receives a \$1 donation for their partnering cat rescue for each completed packet that is returned. The data will be analyzed using multiple regression to predict neotenus behaviors from nurturance, instrumental acts, and emotional expressions.

## Personality Risk and Protective Factors Moderate Associations of Relationship-Contingent Self-Esteem with Mental Health and Relationship Outcomes

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Frane Francis Santic

**ADVISORS** Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Contingent self-esteem occurs when an individual's self-esteem is affected by a specific outcome or situation. This form of self-esteem can occur within different domains, with one specific domain being relationships. Relationship-Contingent Self-Esteem (RCSE) "involves having one's self-regard hooked on the nature, process, and outcome of one's relationship" (Knee, Canevello, Bush, & Cook, 2008). RCSE is said to occur from a thwarting of basic psychological needs, including competence, relatedness, and autonomy. When these needs are not fulfilled, issues such as feelings of incompetence, a lack of feeling of control, and issues with connecting with other individuals can occur. Further, those high in RCSE can have lower relationship satisfaction and experience higher levels of negative emotion felt. The objective of the study is to examine how certain personality risk and protective factors that are correlates of the basic psychological needs influence the relationship between RCSE and relationship and the experience of negative emotion (i.e., depression). The study draws from a large sample of married alumni from a private Midwestern US university. Participants were asked to complete a survey containing a range of measures for basic psychological needs, relationship satisfaction, depression, RCSE, authenticity, anxious attachment, and self-compassion. The study examines how individuals with RCSE are impacted by attachment style, feelings of self-compassion, and other personality factors, as well as what level of depression and satisfaction they currently feel in their lives. If one's basic psychological needs are being met then it's possible that the negative impact of RCSE on relationship satisfaction and depression could be reduced, or possibly eliminated. Understanding what constructs act as risk or protective factors can inform either the creation of or mending of current interventions that are meant to specifically target these constructs. These interventions could in turn, diminish the negative impact of RCSE.

## Beyond the Picture: Elaboration more than Description Enhances Memory and Appreciation for Paintings

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Jacob Severino Avendano, Abigail T Flower, Tessa Nicole Jatczak, Brad Charles Wolfred, Yu Zhao

**ADVISORS** Susan T Davis, Mark A Matthews

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Aesthetic preferences involve many factors that determine how people respond to art. For example, the context surrounding photographic art (e.g., titles) influence its aesthetic appeal (Millis, 2001). The present study examines the effect of titles on aesthetic preferences for paintings. We hypothesize that (a) participants will show greater preference for paintings with elaborative titles compared to descriptive titles, and (b) participants will have better memory for paintings with elaborative titles compared to descriptive titles. Participants evaluated images of lesser-known Van Gogh paintings. Prior to the experiment, a sample of students

was presented with these paintings along with elaborative and descriptive titles to verify that the titles were valid. In the experiment, all participants were exposed first to paintings without titles. Next, participants were exposed to the same paintings in a randomized order with titles. Titles were either elaborative (evoking a deeper thought process, such as “Water Sustains Life” for a painting of a bridge over a stream) or descriptive (naming objects in the painting, such as “Bridge over Water” for the same painting). Participants were asked questions assessing preferences: if they liked the painting, if they would buy the painting, and if they would hang the painting in their home. A control group also assessed the paintings twice, but without the titles present either time. All participants then completed tasks unrelated to the experiment to distract them from reviewing the paintings. Finally, participants viewed the original paintings intermingled with new Van Gogh paintings to test their memory for the original paintings. Preliminary results show that participants prefer and recall more of the paintings with elaborative titles compared to descriptive or no titles. These results support our hypotheses, suggesting that elaboration enhances one’s experience when viewing paintings, and elaboration also make the paintings more memorable.

### **Sleeping on it: Examining the Effects of Sleep Consolidation when Encoding is Interrupted.**

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Taylor Nicole Chambers, Alexander N Lawriw, Gabby Louise Silone

**ADVISORS** Susan T Davis

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Research indicates that memories are strengthened by consolidation, defined as their incorporation during sleep into a previously established memory network (Rasch & Born, 2008; Rasch & Born, 2013). Data indicate that memories are initially unstable after encoding and that sleep consolidation increases resistance to interference (Robertson, 2011). On the first day of a two-day experiment designed to examine whether interrupting the encoding of a memory would affect later memory consolidation, participants in the present research memorized pictures of common objects (e.g., owl, motorcycle) presented in a slideshow. At the midpoint of the slideshow, there was a simulated computer crash. While the experimenter pretended to amend the fake situation, participants completed an unrelated task to prevent rehearsal of the pictures. Shortly after, the slideshow resumed, presenting the remaining pictures. Participants were assigned to either complete an immediate recognition test of the pictures, return to lab the following day to complete a delayed recognition test, or complete both an immediate and a delayed recognition test. We tested three hypotheses; first, pictures that appeared near the beginning and the end of encoding, and those that appeared after the resumption of the interrupted slideshow would be better remembered than those pictures that appeared just before the interruption, due to primacy and recency memory effects. Second, pictures tested for memory only on the second day would be remembered better, due to sleep consolidation, than when tested for memory only on the first day. Third, participants tested on the first and second day would be more confident in their memory of the pictures, and, due to sleep consolidation and repetition, would recognize more pictures on the second than on the first day of testing.

### **The mediating role of idealization in the association between couples’ geographical separation and infidelity**

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Ellen Frances Krueger, Angel Luis, Emily Nicole Panella, Hind Salih, Alicia Michelle Selvey, Gabriella M Vargas

**ADVISORS** Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Although romantic partners are typically characterized as being closer in proximity, long-distance relationships (LDR) are becoming more common. LDRs are more common for various reasons, including educational degree attainment, military deployment, and emigration. Couples use Relational Maintenance Behaviors to continue and enhance the relationship. One such behavior is categorized as idealization, which occurs when a partner focuses on the positive aspects of the relationship and ignores disagreements or areas of contention. LDR couples have a tendency to idealize each other more due to geographical distance and lack of proximity. Previous research suggest that maintenance behaviors negatively correlate with infidelity; it is possible that LDR couples who engage in maintenance behaviors are less likely to cheat on their partners. There are many facets to emotional infidelity, such as sexuality, emotional satisfaction, attitudes-norms, and revenge-hostility. The relationship between maintenance behaviors and idealization has been documented by previous research, but infidelity in relation to both has yet to be explored. Based on previous research, we hypothesize that idealization will mediate the relationship between geographic proximity and infidelity. Specifically, we predict that those who are in long-distance relationships will idealize their partners more than those who are in geographically close relationships, and that higher levels of idealization will, in turn, predict lower levels of infidelity. Mediation will be tested using a bootstrapping technique. Results will be presented.

### **An Exploration of Children’s Executive Functioning and Maternal Emotion Regulation Skills: A Proposed Study**

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Kirsten Lee Anderson

**ADVISORS** Mary Fuhs

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Executive functioning (EF) skills, that is, skills involved in planning and problem solving, are imperative for children's school readiness. According to a nationally representative survey of kindergarten teachers, EF skills are more important for success in kindergarten than purely "academic" skills such as knowing how to count to twenty, recite the alphabet, or recognize colors and shapes (Heaviside & Farris, 1993). Therefore, it is important to understand which factors relate to children's early development of EF skills, especially for children growing up in poverty who are at risk for academic difficulties. Some research has suggested that there is intergenerational transmission of EF skills, specifically linking maternal EF and child EF, but this association has been limited to EF tasks measuring "cool" EF skills or those not involving emotion regulation (Kim, Shimomaeda, Giulano, & Skowron, 2018). The purpose of the proposed study is to examine if mothers' self-reported "hot" EF, or emotion regulation skills, are significantly correlated with their child's performance on their everyday EF skills behavior in both "cool" and "hot" EF skills domains. This study will examine data from 42 mother-child dyads enrolled in a parent education program across sites located in two high-poverty neighborhoods. At the time of enrollment, parents completed a self-report questionnaire of emotional regulation (Wong & Law, 2002) and reported on their child's "hot" and "cool" EF skills as assessed by the Childhood Executive Functioning Inventory for Parents and Teachers (CHEXI; Thorell & Nyberg, 2008). Aggregate scores will be calculated for parent emotion regulation and the CHEXI for "hot" and "cool" items, and simple linear regression will be utilized to examine if there is a significant association between mothers' reported emotion regulation skills and their children's EF skills, controlling for covariates.

## Depression, Suicidality, and Sleep Disturbances: A Literature Review

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Karla Leigh Borgerding

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Past research has shown that it is common for people with depression to report sleep disturbances. However, the relationship between sleep disturbances and suicide is not as well known. The current literature review looks at several articles relating to depression, suicidality, and sleep disturbances. Specifically, how sleep disturbances increase mood dysregulation which may lead to an increased amount of suicidal thoughts (Cukrowicz et al., 2006). Specific types of dreams (e.g. a nightmare) seem to be a prominent symptom of sleep disturbance that may result in greater mood dysregulation, and consequently, more severe and frequent suicidal ideation (A?arg?n et al, 1998). In one study, women tended to report more frequent nightmares than men and were more likely to report suicidal ideation (A?arg?n et al, 1998). From these articles, it is concluded that sleep disturbances are a possible risk factor for suicide among depressed populations. This could imply that therapists should incorporate sleep monitoring into their treatments for depressed and suicidal patients.

## Differences in the Development of Internalizing and Externalizing Behaviors in Children of Depressed Mothers

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Hannah Simone Jackson

**ADVISORS** Jackson A Goodnight

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This research project explores variables that may impact the outcomes of children with clinically-depressed mothers, with a focus on 14- to 17-year-old adolescents. We are interested in learning why some children with depressed mothers develop anxious thoughts or behaviors while others develop aggressive thoughts or behaviors. To do so, we are analyzing relevant variables that have potential to impact or explain the differences in development, such as relational separation and family instability, mother/child relationship, and parenting practices. Statistical analyses have demonstrated that some of these variables of interest are significant mediators between maternal depression and specific child outcomes, but not all of them. This project also uses sibling- and cousin-comparison models in order to ensure that genetics are similar and that environmental factors are the main focus. This research is important as it will give insight on what may be affecting the mental health of adolescents and teenagers, hopefully leading to better education for families and beneficial resources that allow children in these circumstances to thrive.

## Examining the Stability of the Purrsonality of Felis catus, the Domestic House Cat.

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Taylor Nicole Chambers, Alexander N Lawriw

**ADVISORS** Greg C Elvers

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

People have a tendency to believe that their beloved furry felines have their own unique personalities. However, according to the traditional definition of personality, a set of characteristics that are stable across both time and different circumstances, this may

not entirely be true. Previous research into this area has resulted in dimensional groupings of cat personality traits similar to those found within the well-known human equivalent, the Big Five (Feaver, Mendl & Bateson, 1986; Karsh & Turner, 1988; Bennett, Rutter, Woodhead & Howell, 2017; Ha & Ha, 2017). While the number of labels and dimensions discovered typically differs, these studies have all come to the conclusion that cat personality traits do exist, and that they vary from individual to individual. Yet, none of these studies have intentionally examined the stability of these traits, a key component of overall personality. The current study addresses this issue by asking primary caregivers of cats to rate, on a scale from one to five, how well 29 adjectives (taken from Bennett et al, 2017) describe their cat in three different situations and at two periods of time. The 29 adjectives rated by the participants were scored on the six dimensions of cat personality (playfulness, nervousness, amiability, dominance, demandingness, and gullibility) following the method of Bennett et al. (2017). Separate repeated measure ANOVAs were conducted with either situation or time as the independent variable. A Bonferroni adjusted  $\alpha$  level of  $.05 / 6 = .00833$  was used. Significant effects of situation were found for playfulness, nervousness, amiability, dominance and demandingness. Gullibility was not statistically significant. Significant effects of time were found for amiability, dominance, and demandingness. Playfulness, nervousness, and gullibility were not statistically significant at the Bonferroni corrected  $\alpha$  level. In conclusion, while certain personality traits were found to be stable either across time or across situations, others were not; therefore, overall personality was not stable.

## The Role of High-Quality Preschool Experiences in School Readiness Skills Gains

College of Arts and Sciences: Psychology

Poster - Course Project, 201810 PSY 493 28

**PRESENTERS** Maddy Leigh Weimer

**ADVISORS** Mary Fuhs

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Recent research suggests that young children from low-income homes benefit most from participating in high-quality early childhood environments (Geoffroy et al., 2010). It has been further suggested that a high-quality preschool experience can mitigate the link between poverty and difficulties with school readiness (Ladd, 2017). In order to investigate this further, we will test the effects of interactions between classroom quality and maternal education levels and family income on children's school readiness skills in a comprehensive battery of assessments, including assessments of self-regulation skills, academic skills in math and literacy, and social and emotional skills. We predict that children living in homes with parents with lower educational levels and lower income will benefit the most in their school readiness skills gains across the preschool year if they attend preschool at a high-quality early childhood classroom.

## Asking the right questions: An indirect strategy for improving lie detection

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Elliot Duke Buccieri, Adriana Francesca Degenova, Lauren E Murphy, Margaret Frances Weingarz, Scott Anthony Wonderly

**ADVISORS** Susan T Davis, Mark A Matthews

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Despite our ability, innate and learned, to perform many tasks, we are, on average, only 54% accurate at detecting lies; this rate of performance is only marginally better than a lucky guess (Bond & DePaulo, 2006). However, research by ten Brinke et al. (2016) suggests that people may be able to detect deception indirectly. Our team, used suggestions of future research from ten Brinke et al. (2016) to study indirect detection of deception by participants watching the video interview of a person suspected of lying. The first hypothesis for this research was that better deception detection would result from questions that primed implicit associations of dishonesty from an observer than from direct questioning of the observer about the dishonesty of a person in a video. A second hypothesis was that the type of question asked of an observer would produce more correct identifications of dishonesty when the questions (a) evoked biases about the person in the video (e.g., stereotypes that individuals in some professions are more or less honest than others), (b) expectations of behavior of the person in the video (e.g., would the person in the video cheat), and (c) probed about nonverbal characteristics indicating the dishonesty of the person in the video (e.g., fidgeting and looking around instead of at the interviewer). A control group of observers was directly questioned about whether the person in the video was lying. Data collection is in progress and our expectation is that indirect questioning will lead to more accurate deception detection than will direct questioning. We also expect that of the three types of indirect questions, those that evoke biases and expected behaviors will produce better deception detection than will questions about the personal characteristics of the person in the video.

## Vatican II and a major shift in Catholic schools

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Joe Simon Pieper

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 10:30-10:50

Catholic education has long been held as a foundational and important piece of the Catholic experience. Thousands of students attend Catholic primary and secondary school every year. Vatican II brought about major changes to the Catholic Church as an

institution. Many changes were also brought to Catholic education after the conclusion of Vatican II. The occurrences of Vatican II provided Catholic education with much needed updating to the pedagogy which they used to teach students. This post Vatican II offered teachers ways in which to better prepare their students for a faith life in a more secular and modern society. This paper will look at how changes at Vatican II to education gave teachers better tools to empower their students, while also giving schools better reach to non-Catholics. In other words Catholic schools were not only better equipped to defend and strengthen the faith, but to also work as evangelizers for the Catholic faith.

## Understanding Salvation in the Modern Age: Post Vatican II Perspectives

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Taylor Kate Tovey

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 11:00-11:20

Prior to the Second Vatican Council the official teaching on salvation in relation to other religions is summarized in the phrase, “No salvation outside of the Church.” Vatican II is a major turning point in developing the Catholic Church’s approach to salvation. In the aftermath of Vatican II theologians have debated the proper interpretations of council documents including *Lumen Gentium*, “On the Church” which describes the Catholic Church’s role in the world and in salvation. *Lumen Gentium* 16 affirms the possibility of salvation for non-Christians but the actuality of how and by whom salvation is achieved is largely contested.

## Vatican II and the Development of Religious Liberty

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** William Joseph Gross

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 11:30-11:50

Prior to the Second Vatican Council, Catholicism was given a special place of status, protection, and primacy in many nations. This was considered desirable by the Church since Catholicism was encouraged over other religions or competing ideologies. In this way true faith in God was better protected and encouraged for all people in a given nation. At Vatican II, the Declaration on Religious Liberty, *Dignitatis Humanae*, instead described religious liberty as a constitutional necessity in all places. What prompted this change in approach to the relationship between the Church and state regarding religious liberty? How are these changes reflected in the Church today, particularly in the United States? This research looks at the historical development of the relationship between the Church and state before, at, and after Vatican II into the present. In addition to *Dignitatis Humanae*, other texts from the council reveal that conscience contributed largely to the new formulation of religious liberty.

## Nostra Aetate Today: The Importance of Living out Nostra Aetate in Today’s World

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Rachel Ann Nartker

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 12:00-12:20

Nostra Aetate is one of the more significant documents that came out of the Vatican II council. Though the council released it many years ago, it still is of great importance today. Nostra Aetate discusses how Catholics should view and interact with non-Catholic religions. This document was not only important in its time, but is still very important today in a world that still faces religion-based clashes. The guidelines this document offers, especially the call for dialogue, if practically followed, could be very useful in today’s world, especially to the youth.

## Chant to Contemporary Music in the Catholic Mass

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Kathleen Adeline Zahn

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 12:30-12:50

This talk will cover a brief history of Gregorian chant and its use in the mass, including an overview of the chapter on liturgical music in Vatican II’s “Sacrosanctum Concilium” (1963) and key passages in the U.S. Catholic Bishops’ document “Sing to the Lord” (2007). It will then discuss the contemporary music that is currently used in mass today by the worship team at the University of Dayton Chapel. Finally it will discuss if we have lost the culture of chant in mass and then discuss how we can move forward in reincorporating chant into mass while still allowing contemporary music in the mass.

## What Happened to Active Participation?

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Martin Palmasani

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 1:30-1:50

In the First half of this presentation, I will paint the background image of the Church's liturgy before Vatican II. In those days the people were physically present but as simple spectators, not active participants. The pre-conciliar efforts to improve this led to the creation of the council's liturgy document which highlighted liturgical reform having active participation as its main goal. I will show how this led to key changes, like Mass in the Vernacular for example. In the second half of this presentation I hope to make an argument for the need of another revitalization for active participation. Using the study titled Going, Going, Gone that shows reasons why people have left the Catholic faith, I will show that there is a decline in faithful participants in the coming generation that may continue to decline for years to come. One of the major reasons to this is the lack of education about the faith. This lack of education creates a chain reaction of those people not understanding the mass, thus not opening themselves to God, thus resulting in the abandonment of the faith. The graces of the liturgy are present, but the congregation is not actively participating. Many examples in Going, Going, Gone involved men and women leaving for reasons of "no longer being forced to attend", "Not believing in everything the Church says", or finding Church practices and doctrines to be "ridiculous" to name a few examples. These issues are changing the way the faith is understood and many of them are brought out of misinterpretation that can easily be rectified with greater education.

## Taking College Students on the Silent Journey: Reclaiming Silence in a Culture of Noise

College of Arts and Sciences: Religious Studies

Oral Presentation - Course Project, 201810 UDI 163 01

**PRESENTERS** Joe James Oliveri

**ADVISORS** James Schimelpfening, Sandra A Yocum

**LOCATION, TIME** Kennedy Union 310, 1:40-2:00

We live in a culture of noise, a world of busyness. On a college campus, it is even harder to find time for silence, for prayer, for simply - being. As I minister to students in their daily lives of classes, extra-curricular activities, social media, music, relationships, it seems especially hard for them (much like myself) to reserve time for silence and recognize God's presence always and everywhere. In my mini-course, I took eight students on "The Silent Journey" in hopes to not just find more silence but to silence (discipline) their words, actions, thoughts, feelings, and imagination through Marianist spirituality and Catholic Christian contemplative traditions. Students met for two hours once a week to pray, listen to one another, and learn more about ways to practice silence amidst the noise in their lives. The hope was that these students would see that silence is not only the absence of something but the presence and way of life of something greater. It is my belief that only then will prayer impact our faith and lives deeply so we can make a positive change in this noisy, busy world we all share as one.

## An Evaluation of Contrasting Views of University Campus Concealed Carry

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Capstone Project

**PRESENTERS** Kyle H Dobies

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Today a majority of states have laws that prohibit guns from being carried on university campuses. However there are a few that have enacted laws that protect the rights of individuals who choose to carry a firearm. In select other states the decision is ultimately placed upon the university or college to prohibit or allow students and staff to carry weapons on their campus, even though it may be legal by state law. With recent cases of violence on college campuses, many states have completely prohibited firearms while a few others have legalized it. The purpose of this research is to examine state gun legislation and perceptions of concealed carry on campus from the individuals that it directly affects: university staff and students. Additionally, how concealed carry has changed and progressed over recent decades involving times of war, terrorist threats, school shootings, and other fears will also be analyzed.

## How poverty affects the management of a water contamination crisis in the city of Dayton

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Alyssa Marie Miller

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The city of Dayton prides itself on the quality of its water. However, contamination at the Behr Plant, which is the former site of Chrysler and now a Superfund site, in Northern Dayton threatens the health of residents in that area. This presentation explores the demographic and socioeconomic characteristics of those who live around the site and whether those characteristics help us

to understand the level of power and privilege local residents had in the various stages of site contamination. To do this, I draw on sociological literature, Facing Project Narratives (a program from the University of Dayton), and local Dayton news articles. Additionally, I will compare past and present northeastern Dayton neighborhoods affected by the contamination and I will observe if any policies have been passed to avoid such catastrophes in the future.

## **Cross-Cultural Medical Interpretation: A Proposed Certificate for the University of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Honors Thesis

**PRESENTERS** Kevin Laurence Outwater

**ADVISORS** Simanti Dasgupta

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The medical profession today is anchored with English as the primary language. Therefore, some individuals may struggle to communicate, causing the usage of interpreters to lower the burden for these patients. This interpretation model is going to address not only the primary skills of medical interpreters, but will also address languages and culture, in attempt to highlight meanings, and integrating other cultural notions. Since the demographics in the United States is changing, it is necessary to adapt these language and cultural changes to the medical field. Through this, I propose this interpretation model to be incorporated at the University of Dayton, becoming a medical interpretation certificate. This would follow the University's belief in "Commitment to Community" by engaging with members of the Dayton area.

## **Media Portrayal on the Legalization of Marijuana in Colorado and Ohio**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Capstone Project

**PRESENTERS** Quinn Marie Carlson

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In order to have a better understanding on the legislation of the legalization of marijuana in Colorado and Ohio, I will be conducting a content analysis on media portrayal. The study will be done through news articles that discuss the legalization of marijuana throughout Ohio and Colorado. The media that I will be using will come from national news sources, from all spectrums of the political scale. The reason for this is so that I have diverse articles, with varying opinions and ideologies behind the writers of the media. I will have a set of guidelines of questions to ask when determining which media to use. Some of these questions will include, "For what audience was it produced?" "Is an opinion shown or given in this article?" and "When was it produced?" These will help me organize and filter through various media that I am exposed to and to create a systematic way to analyze the media. The overall purpose of this research will be to examine the media portrayal of the legalization of marijuana in both Colorado and Ohio. More specifically, if the way that news articles from a national level are portrayed has any bearing on whether or not marijuana legislation passed in the two previously listed states.

## **21st Century Policing in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Capstone Project

**PRESENTERS** Max Hunter Boorsma

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In light of the 2015 Presidential Task Force on 21st Century Policing (Task Force), police departments across the country have been adapting with the ever-changing culture of the United States. The Task Force highlights six pillars essential to effective modern policing that are discussed throughout this research, with an emphasis on pillar one, Building Trust and Legitimacy and pillar four, Community Policing and Crime Reduction. This research attempts to answer the questions of how the Dayton Police Department (DPD) is engaging with the findings of the Task Force and how the public perceives the Dayton Police Department. Exploring the first research question, this research analyzes DPD programs in relation to the Task Force pillars. Discussion of the DECA Taft Seminar highlights the focus on Problem Oriented Policing (POP) and Community Oriented Policing (COP) in relation to pillars one and four. A content analysis of twitter is used to explore the public perception of the DPD. This is an analysis of all 2017 public tweets from twitter users in the Dayton area, which include the key word 'police'. Discussion of DPD programs in relation to the Task Force pillars allows for analysis and recommendations based on relevant literature. The objective of this paper is to highlight connections between the DPD and the Task Force and to gauge the success of DPD programs based on public perception.

## **How is human trafficking depicted online?**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Mara Nerlinger Joelle Nerlinger

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:03

Human trafficking is a current and relevant social issue. While human trafficking has gained some attention in the media and in the academic literature, the details about human trafficking remain elusive. Using content analysis, this study examines 10 human trafficking websites to examine common themes in how human trafficking is depicted online. The findings show common themes related to gender, specifically the relationship between gender and visual images, sex trafficking and labor trafficking, and language. This content analysis explores the variability between what is discussed in the academic literature and how this compares to online depictions of human trafficking.

### **Let's Get It On: An Analysis of LGBTQ+ Hookup Culture at The University of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Elizabeth Clara Kyle

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

Hookup culture is a phenomena that has changed modern dating culture through altering attitudes about sexual interactions, especially on college campuses. Previous research on college campus hookup cultures tends to focus white, middle class, heterosexual relationships and attitudes. This study examines perspectives of hookup culture within the LGBTQ+ community on the University of Dayton's campus, a group often not acknowledged in research. Through one-on-one interviews, respondents expressed their views on hookup culture and how it potentially differs and relates to heterosexual, college campus hookup culture. A deeper look into themes from respondents will be further examined in my presentation.

### **Perception of Bystander Intervention amongst Students at the University of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Caleb Negrón

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

Sexual violence is a prominent issue on college campuses with the majority of survivors consisting of women. Bystander intervention is heavily promoted as an effective method to combat the issue especially in the context of a college campus due to higher risk of individuals experiencing sexual violence. In this study, we are looking at an alternative programming of promoting bystander intervention through the use of peer-to-peer dialogue as well as how gender influences the likelihood of someone intervening. The peer-to-peer programming that will be utilized in this study is called PAVE Chats. Pre- and post-surveys are used to examine key factors associated with changes in students likelihood to intervene in a situation. These findings help identify other methods of bystander intervention programming and how gender influences the students likelihood of intervening.

### **“Sleep, eat, hydrate, masturbate!”: Sexuality education, digital media, and creator identity implications**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Emma Rutledge Venetis

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

With the rise of digital technology, authority figures are no longer able to regulate what information young people have access to. Yet, the curriculum in sexuality health classrooms continues to be debated while little research has been done examining the easily-accessible information that lives on the Internet. This thesis analyzes two popular sexuality education-based channels on YouTube, sexplanations and lacigreen, with subscriber counts ranging from nearly half a million to over 1.5 million. Data were collected through content analysis of approximately 27.5 hours of video. Findings indicate that sexuality education on YouTube takes a comprehensive, “sex positive” approach, covering a range of topics including anatomy, sexual orientation, consent, contraception, and sexual instruction. Video creators' values and identities, as well as the structure of YouTube itself, impact the information that is presented. This analysis is significant as indicates that formally regulated sexuality education programs may no longer be relevant and user-generated digital education is introducing new perspectives on sex and sexuality to young people.

### **How do you prefer your coffee? An outlook on interracial relationships**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Cheranee L Baker

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30



This project examines the experiences of those in an interracial relationship and how that has affected their relationships with family and friends. The goal is to examine if and how interracial relationships have evolved, since they have become legalized. This research uses data gathered from interviews with interracial couples. The findings point to improvements over time in acceptance and approval from families, friends, and the church. Other related factors, such as religion are also discussed.

### **The Experiences of African American Female Student Athletes at a Predominately White institution**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Javonna La'Mae Layfield

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

African Americans make up the largest portion of students on collegiate athletic scholarships. While much has been written about the experiences of African American male athletes, less has been written about the experiences of African American female athletes. This study examines how African American female student-athletes on the University of Dayton campus view their own experiences as being similar or different from their white athletic peers. Data are gathered using interviews with a convenient sample of African American women athletes. The participants share how their positionality of being a woman of color athlete impacts their experiences on campus academically, socially, and emotionally. The findings of this study suggest that women of color athletes occupy a unique role on campus; using an intersectional approach, their experiences cannot be reduced to “only race” or “only gender.”

### **Big Man on Campus: How does social construction of gender impact male college athletes?**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Masashi Greg Sakamoto

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

Male athletes are often glorified in the media as “the big men on campus,” as they enjoy elevated status on their college campus. Similarly, much has been written about toxic masculinity, and the expectations for men to value dominance, power, and control; this is especially prevalent among “toxic jock” identities which is associated with greater health risks. This study further explores the social construction of gender among male college athletes. Data are gathered using interviews with a convenient sample of male college baseball players who have experience competing at Division 1-level universities across the U.S. The findings from this study suggest that male college baseball players have an elevated status through their peers on campus and their idea of masculinity varies based on the size of their university.

### **Baby boomers and college students: Understanding the changing interactions between female baby boomers and students**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** MaryPat Globig Marx Globig

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

Faculty and staff members who have worked at a university for twenty or more years are in a unique position to be able to discuss how interactions between faculty/staff and students have changed over time. This study answers the question “How do baby-boomer faculty and staff members see a change in how students interact with them throughout their twenty or more years working in a university setting?” Data was collected using interviews with female faculty and staff who have worked in a university setting for more than two decades. Results indicate that female faculty and staff typically notice a shift in how students interact with them over the years; this shift is often attributed to different generational and cultural values as well as assumptions related to ageism and sexism.

### **Farm to Liberation: Towards Feminist Food Justice**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Elisabeth Clegg Spector

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

Women are one of the many vulnerable populations experiencing the detrimental effects of human-induced climate change, and our current system of food production is one of the largest contributors to this global problem. Not only do modern methods of food production contribute significantly to climate change, but they devalue women's knowledge and strip away their opportunities. A

number of communities and individuals have begun to work against this system and work towards food justice through small-scale farming and growing their own food. Through the use of ecofeminist scholarship and original interviews, this project examines the problems with our current food system and suggests steps and solutions for moving forward. So long as women are being fed by the very same systems that subordinate them, they will never be truly liberated, making it necessary for feminist food justice.

### **Global Injustice: El Salvador, Human Rights, and Liberation**

College of Arts and Sciences: Sociology, Anthropology, and Social Work  
Oral Presentation - Course Project, 201780 ANT 325 01

**PRESENTERS** Therese Christine Golonka, Emily Clare Monczynski, Ellie Elise Rizzo, Emily Rose Wellmann, Corinne Mallory Woodruff

**ADVISORS** Miranda C Hallett

**LOCATION, TIME** Kennedy Union 310, 11:30-12:30

What are the ethical obligations facing human beings in a highly unequal world? What does working for social justice and human rights mean in the Americas today? How does Catholic social teaching apply to contemporary issues of armed civil conflict, refugees and immigration, economic inequality, and more? What are the ethical dilemmas at the heart of today's headlines, and how can we be responsible global citizens in an era of nationalism? In this panel, we'll share the learning and insights we've gained through intensive study and immersion in the recent history and contemporary challenges of a small Central American nation, El Salvador. We will describe our thrilling and challenging adventure in El Salvador in January 2018. In recounting how we encountered conditions of cultural, social and political existence that moved us beyond our comfort zones, we'll also reflect on the ways these experiences might shape our future ethical commitments and social action. We will also talk about the broader insights we can gain from the local realities faced by the country, insights that touch on struggles over troubling contemporary issues such as immigrants' rights, state violence, and environmental crisis. Panelists will also share how they learned to think anthropologically through the course, and how anthropological perspectives can contribute to human rights efforts. This fall semester, another anthropology seminar focusing on human rights will be offered, this time connected to a public education project centered on immigrants' rights. Students will also have the option to cap their course experience with a trip to El Salvador during January 2019 intersession. Panelists will field questions about the course, and what it takes to prepare for a trip like this.

### **College Students' Perceptions of Urban Crime**

College of Arts and Sciences: Sociology, Anthropology, and Social Work  
Oral Presentation - Capstone Project

**PRESENTERS** Jennifer Marie Sloan

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** Marianist Hall Learning Space 218, 1:00-1:20

Students' safety on college campuses has been a concern in research for many years. Students at urban, rural, and community colleges have different perceived levels of safety based on a number of personal and contextual factors. Previous literature on this subject typically focuses on students' level of fear of risk of victimization on college campuses. However, this does not explain students' fear of the community in which their university is located. The purpose of this project is to examine these perceptions of crime in the community, based on a study of students at the University of Dayton. By examining their perceptions of crime at the university and surrounding Dayton community we can recognize existing stereotypes of urban populations and understand the extent to which a student's education, background, and family demographics influence their perceptions of urban crime and safety.

### **Grow Up, Not Old: The Perspectives of Caregivers in an Anti-Aging Society**

College of Arts and Sciences: Sociology, Anthropology, and Social Work  
Oral Presentation - Capstone Project

**PRESENTERS** Mary Lucy Hoffman

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

From 2012 until 2050, the United States is projected to experience significant changes in its age structure, which will render the population of citizens age 65+ the leading age demographic within society (Ortman, 2014). In response to a rapidly aging nation, this study aims to examine individual perspectives towards the social and psychological effects of the anti-aging construct (i.e. the construction of a social movement which rejects the process of aging and devalues the lives of elderly individuals) and its prevalence (i.e. the scope and magnitude of the anti-aging construct) within eldercare environments and for caregivers employed within the eldercare industry. To do this, a series of interviews have been conducted with multiple individuals that occupy a formal caregiving role. The results of this research will be discussed in the context of qualitative analysis, drawn from specific interview content. Additionally, the societal implications of these research findings will be discussed.

### **The Expression of Depression: The Role of Depression Forums in the Representation of Depression**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Mary Angeline Macrae

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

There is a growing body of research examining the relationship between social media and mental health. Multiple studies suggest a link that increases in social media consumption is associated with declines in mood, sense of well-being, and overall life satisfaction. This research examines the mental health problems of depression and how that relates to social media usage. Using a content analysis of popular online depression forums, this study investigates depression, social media, and online expression. The findings from this research can help provide clarity on depression and social media, which can be used to inform future prevention and intervention forums and programs.

## **Why Do You Drink? Drinking to Cope as a Result of Anxiety and Depression Among College Students**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Megan Marie McDowell

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

Alcohol is often seen as a social and inevitable aspect of the college experience. However, there are students who use alcohol as a way to cope with feelings of both anxiety and depression. The purpose of this study is to determine whether there is a connection between drinking to cope, and anxiety and depression among college students at the University of Dayton. To gather the information necessary for this study, University of Dayton seniors were asked to complete an online anonymous survey about both their drinking habits and any possible feelings or signs of depression and anxiety within the last year. This study looks at gender differences, social anxiety, reasons for drinking as much as they do, and consequences that could occur as a result of such drinking habits. This study can help college students understand and be aware of drinking to cope signs within their own lives or in the lives of others.

## **Social Influences of Substance Abuse Relapse**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Gabriela Ana Milos

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

Substance use is a major problem in the United States, emphasized even more recently by the opioid epidemic. Even after entering treatment, it is common for people who are addicts to relapse. Many professionals contend that relapse is a natural part of the recovery process. There are, of course, factors pertaining to individual traits that contribute to relapse. This project examines the perspectives of social work professionals in the field of substance abuse recovery and what they view are the social influences of relapse. Findings from this research will connect to factors, such as family attachment and support, work commitment, respect for authority, social interest, social bonding, religious commitment, and conventional beliefs.

## **And How Does That Make You Feel?: Emotional Wellness of Resettled Refugees in the U.S.**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** BreAnn Mahannah Hill

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

From July 2015 through July 2016 the United States welcomed 84,995 refugees from around the world; many of these refugees escaped trauma and violence from their native country. Leaving one's home country has the potential to be a traumatic experience which can have a lifelong impact on mental health. The purpose of this study is to further understand the support systems in place for how refugees in the United States take care of themselves mentally and emotionally after they have been resettled. This study examines interviews with experts on refugee resettlement in Dayton, Ohio, including those who work at social service agencies that provide aid to refugees. The interviews are analyzed for both content and themes that reflect coping strategies used by refugees. The findings highlight the importance of understanding trauma informed care and why this approach can be beneficial to resettlement agencies in order to address emotional wellness of resettled refugees.

## **The Internet Made Me Do It: How the Internet Effects the Image of Presidential Candidates**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Colleen Anne Dwyer

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

The internet is a unique and relatively new source for spreading news. It can instantaneously share information worldwide with a click of a button and can usually be accessed for free. More traditional news platforms like television and print are still big competitors in the news industry but operate differently. A presidential election in the United States is one of the most crucial times for news coverage and a time when many Americans prioritize learning about candidates. This project aims to determine whether someone who gets their presidential campaign news solely from the internet will view a candidate as more or less knowledgeable compared to someone who got none of their news information from the internet. To examine this topic, I use the Supplementary Empirical Teaching Units in Political Science (SETUPS) data from the American National Election (ANES) 2016 Time Series Study, which were retrieved from the Inter-university Consortium for Political and Social. The analysis of the data will control for sex, age, race, region where respondent grew up and if they voted in the 2016 election. This research uncovers the variation in perceptions of presidential candidates between those who do and do not use the internet for news.

### **Is preschool helping students?: The relationship between preschool enrollment rates and third grade test scores.**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Pamela Dawn Venard

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

Pre-school is becoming more commonly used to help children start their academic careers. However, research is mixed on how well preschool impacts student achievement. In this study, I use data from the Ohio Department of Education and the U.S. Census to examine third grades test scores for each school district in Ohio from the 2016/17 school year and their relationship to preschool enrollment rates in 2012/13 school year. I will be controlling for population and percent poverty. Findings from this research will present the relationship between preschool enrollment and the third grade test scores and whether that relationship varies across school district level poverty.

### **Early Childhood Education: an Analysis of the Correlation in Daily Reading Habits and Family Income**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Carrie Anne Matthews

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

Children's educational development is associated with early childhood experiences, such as being read to on a regular basis. However, such experiences may be influenced by factors related to family income level. This research examines the relationship between a family's poverty level and whether or not a child is read to everyday. To address this research topic, data from The Massachusetts Early Care Education and School Readiness Study are used, which contain variables related to family poverty status and how many days per week the child was read to in the home. Findings will provide an initial understanding of how daily reading habits vary across family poverty status.

### **Does education explain perceptions of immigrants? A closer look at the General Social Survey**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Emily Patricia McAleese

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

The United States is one of the top destinations for immigrants with over 44 million currently living in the U.S. The overall perceptions of immigrants varies greatly across the country. This study provides an in-depth analysis of whether Americans think immigrants are good for the overall country and whether education attainment relates helps explain variation in perceptions. The data for this study is from the General Social Survey, which is a nationally representative sample of adults in the U.S. The results of this study help uncover the characteristics that could influence one's view on immigrants. With debates around immigration reform are receiving national attention, understanding how perceptions of immigrants vary by socioeconomic factors may be helpful to policy makers.

### **What can poverty affect? The effects that poverty has on education**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Sidney Alexandra Leroy

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

Previous research has shown that poverty has a negative effect on student success in school. I am performing quantitative analysis on existing data sets to learn how poverty affects student dropout rates. I will be using data from the American Community Survey 2012-2016, collected by the United States Census Bureau. My research will present the relationship between dropout rates and poverty rates across school districts in the state of Texas.

### **Economic Restructuring in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** William David Rice

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Dayton Ohio use to be a huge and growing blue-collar community. In the past 30 years, several large factories have moved away, leaving former employees struggling to find new jobs. Drawing on Facing Project Narratives in Dayton and social science literature, this project will examine the causes and effects of economic restructuring that occurred between 1980 and the 2000s. In addition, this poster will provide an overview of efforts to overcome the unintended consequences of economic restructuring in Dayton.

### **Police Brutality in the Dayton Community**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Shelby S Goble

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Police brutality can be defined as the use of excessive or unnecessary force by police when dealing with civilians. It has been in issue in the Dayton community for years and with the recent shift in focus in the media, this problem has received more attention locally, as well as nationally. This topic brings to light issues within the criminal justice system as well as community issues, such as racism, poverty, and other social inequalities. The goal of this poster presentation is to highlight the community level issues that perpetuate criminal behavior and encourage police brutality. Drawing on social inequality literature and Facing Project Narratives from Dayton, this poster will discuss concentrated poverty and racism and their role in promoting criminal behavior. The presentation will also cover possible solutions to the issue of police brutality such as more community involvement from younger generations or more attention from the city. A problem as serious as police brutality deserves more attention, action and change.

### **Institutional Racism in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Kenni Jean Graham

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Institutional racism refers to institutional beliefs or vocabulary that denigrates minority racial groups and that perpetuates systematic racial inequalities in society. This project examines forms and consequences of institutional racism in the history of Dayton. Drawing on Facing Project Narratives along with social inequality literature, this poster will identify historical forms of institutional racism that reflect and produce racial inequality in society today. In addition, this poster will discuss how social change has occurred around institutional racism and provide community-level recommendations to help ameliorate the persistent repercussions of these policies on the city of Dayton.

### **History of White Flight in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Emma Nicole Bohaboy

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This presentation will examine the causes and consequences of white flight in Dayton during and following the Civil Rights Era. Drawing on Facing Project Narratives from residents of the Dayton area and social science literature, this poster will highlight the history of the white flight movement in Dayton, Ohio. The poster will help viewers understand the effects of white flight and other forms of discrimination and segregation on the city of Dayton at the time the events were taking place (throughout the 1900's) and the issues that remain today. I will present information on the social impact of white flight and discriminatory practices on the

Dayton community and will explain some of the ways that the city is attempting to address these problems.

### Struggles in Single Parent Households

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** James Gerald Hatstrup

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Single parent households in the Dayton area face greater hardships than families that consist of two parents. Research suggests that single parent families are presented with bigger problems, such as financial constraints and lower educational achievement among their children. Drawing on Facing Project Narratives and social science literature, this poster will highlight how single parent families face more challenges providing for their children and themselves. The subsequent challenges children of these families face will also be discussed. Finally, I will identify current programs designed to assist single parents as well as how other programs might also be effective.

### Dayton and the Opioid Epidemic: A Tragedy in the Making

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Courtney Rose Kemna

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Dayton has one of the highest drug overdose rates in the United States. This opioid epidemic can be linked to a number of broader socioeconomic challenges facing the area, including unemployment, the decline of manufacturing, and location. This poster will highlight information on this epidemic and its causes in the Dayton area. To do this, I will draw on social science concepts and theory as well as informal interviews with professionals who are engaged in the epidemic. In addition, I will provide an overview of current efforts in Dayton to address this issue (e.g. Community Overdose Action Team, Miracle Makers, and East End Community Services) and argue that long term solutions will require addressing the root causes of the epidemic.

### Open Minds to Open Doors: How Dayton is Becoming More Inclusive

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Haley Marie Sandifer

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The city of Dayton, OH is a small-scale example of a problem facing our nation: the lack of understanding between different groups of people living in the same area, leading to a sense of separation and often exclusion. Frequently ostracized groups include immigrants or minorities and people living in impoverished conditions or in low-income areas. I will use class literature, historical documents, excerpts from the Facing Project Narratives in Dayton, and direct communication with community members to show the negative effects of these harsh divides between groups in Dayton. The goal of my poster is to increase awareness about this issue and to show that strides are being taken in our city to break down these barriers, foster unity, and enact social change. Programs such as The Longest Table, Welcome Dayton, and Peace Dayton will be discussed.

### Social Change in Dayton

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Sarah A Critchfield

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Volunteer programs that help people residing in low-income communities get involved with the rehabilitation of their neighborhoods can be a valuable tool in facilitating social change. The Mission of Mary Farms co-op demonstrates how social change can occur through community engagement and open discussion. Mission of Mary Farms provides experiential learning, fresh produce, and volunteering opportunities. This presentation will explore how communal involvement and conversations about the future can lead to the restoration of Dayton. I will examine how Mission of Mary navigates the line between rebuilding a community and gentrifying it. I will also investigate how this co-op has affected its community and if it can expand to reach more of the Dayton area.

### Community Shift Towards Individualism

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Hannah Katherine Donovan

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Public Social Capital is the network of relationships of people that a person knows and the resources they provide for them; as defined by McNamee (2014), "the social capital grapevine is only available in and through relationships and the groups which these relationships occur," (79). The resource base for higher socioeconomic groups is far wider and deeper than that of those lower socioeconomic origins which creates a gap in information and influence between economic groups. Drawing on social inequality literature and the Facing Project Narratives related to public social capital, this poster will discuss the impact of changing neighborhoods and public social capital in the Dayton area. Understanding how social capital functions to either aid or limit in number of opportunities, resources, and connections in society. Currently and looking into the future, I hope to examine the resources available to connect people and grow in their associational life.

## **Social Inequality is not Healthy**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Heather Christine Essman

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Social inequality has led to poor health in people experiencing poverty. People facing social marginalization and isolation lack access to the same health care as those who are wealthier. Drawing on Facing Project narratives and social science literature, this poster will provide an analysis of the impact of social inequality on health. It will discuss the history, causes, and elements of social change that the future may hold. Finally, social insurance and public assistance programs such as Medicare and Medicaid will be discussed as well as their relevance to addressing such health disparities.

## **Complications of Housing Arrangements in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Dylan Anthony Penna-Powell

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

American homeowners accumulate material wealth as they gain equity on their homes. A sociological look at how people are distributed around the city of Dayton according to their socioeconomic backgrounds reveals more than geographical details of social and economic inequality. This presentation explores the effects that disparities in housing arrangements have on closely related areas of interest such as education, access to affordable and nutritious foods, and individuals' likelihood of economic mobility. In addition, opportunities for reform through public education funding via local property tax dollars will be discussed. Reformation of a system in which the value of one's home is tightly linked to the quality of nearby public schools would provide greater opportunity for social and economic mobility to those in low-income communities.

## **The Impacts of White Flight in Urban Neighborhoods of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Aaron Joseph Pirc

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The challenges that face Dayton's public schools are the product of a number of historical events, including segregation, block busting, and white flight. Drawing on the Facing Project Narratives, news articles from the city of Dayton, and social science literature, I describe these challenges. This poster presentation raises awareness on the issues students face. In addition, programs that have attempted to improve educational outcomes in Dayton (such as Dayton Early College Academy) will be discussed.

## **Dayton and the Great Recession**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Nick Steven Lafrance

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Today, the city of Dayton, Ohio is still currently experiencing the side effects of the housing plummet in 2008, also known as the Great Recession. This poster will examine how, what, and why the Great Recession of 2008 happened. Meanwhile, keeping in mind that this is not the first time our country has experienced an economic fall. Drawing on social inequality literature, Facing Project

Narratives, and national and local data, this poster will follow the effects the Great Recession has had on our local economy and more specifically the city of Dayton.

### **Poverty and Inequality in Dayton and the Surrounding Areas**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Eric Wallace Handorf

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Today, there are severe disparities in economic well-being between the city of Dayton and the surrounding areas. This project examines the historical causes and current consequences of severe economic inequality in Dayton and its surrounding areas, as well as how social change has occurred around this topic. To do this, I draw on the Facing Project Narratives, social inequality literature, historical documents, and current work being done to help the problem. The project will conclude with recommendations as well as an overview of current efforts that specifically address poverty and inequality.

### **Feeding the City: Food Access and Grocery Stores**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Tiffany Erin Hendricks

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Several areas of Dayton are considered "food deserts," meaning that fresh fruit and vegetables, along with other healthful whole foods, are largely unavailable in these areas. Drawing on Facing Project Narratives in Dayton as well as social science literature, the purpose of this research poster is to investigate food access in the City of Dayton. More specifically, this poster will highlight the causes, conditions, and effects of food deserts and how the presence of a food desert can be representative of the inequalities present in Dayton citizens' lives. Additionally, connection between poverty and food access is discussed as well as current and potential efforts to combat this issue such as the Urban Renewal Farm, government-subsidized grocery stores, food cooperatives, and increasing the size and resources available for urban growing.

### **Redlining: Lasting Scars in the City of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Jillian Marie Malone

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Redlining, a practice of systematic discrimination against African Americans in the distribution of home loans, left scars on the city of Dayton that can still be seen in housing patterns today. These patterns have a ripple effect not only on housing, but also on issues such as inequality in education and wealth. Utilizing narratives from the Facing Project, historical maps, and sociological literature, this poster seeks to shed light on the effects of redlining in Dayton by providing a historical context and theoretical framework. This poster will also explore current efforts in the city that aim to address and ameliorate the lingering effects of redlining.

### **Race Represents Nothing and Everything**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Faith Ann Senkbeil

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

While many of the institutionally racist practices in American history have been eliminated, other forms of racism persist. For example, personal racism occurs when individuals or social groups, governed by behavioral norms, support racist thinking and increase active racism. This type of racism affects an individual's ability for social mobility as well as their equality in schools, neighborhoods and society as a whole. Drawing on examples of personal racism from social science literature and the narratives of the Facing Project in Dayton, I will show how personal racism limits social mobility as well as how acts of resistance are used to overcome it. While addressing institutional racism is a first step to creating a more equal society, addressing personal racism must also be part of the solution.

### **The Roads that Divide: Examining the effects of road systems in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01



**PRESENTERS** Nathaniel L Quam

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The highway system of Dayton was meant to facilitate higher productivity and movement of people. The highway system of I-75, 35, I-70 and the other lesser major highways in the area did make for faster travel, but this had unintended consequences. They came in the form of the white flight movement and the creation of suburban areas around Dayton. Drawing on Facing Projects Narratives, I will use this presentation to highlight the demographic and socioeconomic shifts in Dayton neighborhoods that led to the mass exodus of capital and amenities in these areas. This poster explains why this change occurred, the consequences of those changes, as well as potential changes that could occur to desegregate the population from wealthy suburban and poorer urban populations.

### **Teen Pregnancy: An ongoing trending the Dayton area**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Sami Marie Rossiter

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Teenage pregnancy can lead to a number of negative consequences related to child health and well-being. Teenage pregnancy in the Dayton area is a continuing issue from year to year. It is just one effect of social inequality that stems from people living in poverty with limited access to adequate education and opportunities. The goal of my poster is to identify the past and current trends of teenage pregnancy in Dayton, as well as give sight to what could be done in the future to improve what needs to be adjusted. There are multiple approaches that I will explore that could be used to ameliorate teenage pregnancy. To start, we must fully understand the extent of the issue and what the root causes of teenage pregnancy are.

### **Challenging the American Dream in Dayton, OH**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Abby Anne Pech

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The ideology of the American Dream has a negative impact on those who are low income by creating a false perception of what it takes for residents to reach their full potential. The American Dream emphasizes that everyone has the freedom and ability to succeed, economically and socially, through hard work and dedication, but fails to address the underlying barriers that stand in the way of this achievement. Drawing on narratives from the Facing Project in Dayton and social science literature, it is clear that non-merit factors such as social capital, cultural capital, and inheritance hinder the poor from achieving the American Dream. The goal of this poster is to highlight the historical impact of the American Dream on people in the Dayton area and emphasize how the upper class has an unfair advantage over the lower class. It will delve into the functional and conflict explanations of poverty and examine the issues surrounding the four ingredients needed to obtain the American Dream, which include talent, the right attitude, hard work, and moral character. In order to level the playing field in the Dayton area, I recommend a number of measures that could begin to foster equal opportunity to the American Dream.



**School of Business Administration**

organized by department/start time

### ACC 602A - Information Assurance Presentations on Analytical Procedures (Part 1)

School of Business Administration: Accounting

Oral Presentation - Course Project, 201810 ACC 602A 01

**PRESENTERS** Aidan John Butler, Caitlin Rose Cantwell, Peter Michael McNeely, Maggie Roller

**ADVISORS** Marsha K Keune

**LOCATION, TIME** Miriam Hall 104, 1:00-2:00

Master of Professional Accountancy students present the results of a class project utilizing Tableau, a data visualization tool, to develop, evaluate, and communicate analytical procedures commonly performed by external auditors.

### ACC 602A - Information Assurance Presentations on Analytical Procedures (Part 2)

School of Business Administration: Accounting

Oral Presentation - Course Project, 201810 ACC 602A 01

**PRESENTERS** Alison M Berry, Tyler David Grile, Timothy James Hoffman, Elinor Louise Schuck

**ADVISORS** Marsha K Keune

**LOCATION, TIME** Miriam Hall 104, 2:20-3:20

Master of Professional Accountancy students present the results of a class project utilizing Tableau, a data visualization tool, to develop, evaluate, and communicate analytical procedures commonly performed by external auditors.

### ACC 602A - Information Assurance Presentations on Analytical Procedures (Part 3)

School of Business Administration: Accounting

Oral Presentation - Course Project, 201810 ACC 602A 01

**PRESENTERS** Jack Robert Crain, Jacob Michael Finley, Miranda Nicole Kurlandski

**ADVISORS** Marsha K Keune

**LOCATION, TIME** Miriam Hall 104, 3:40-4:40

Master of Professional Accountancy students present the results of a class project utilizing Tableau, a data visualization tool, to develop, evaluate, and communicate analytical procedures commonly performed by external auditors.

### Flyer Enterprises

School of Business Administration: Crotty Center for Entrepreneurial Leadership

Oral Presentation - Independent Research

**PRESENTERS** Jon David Allen, Ryan James Barnes, Daniel Robert Bott, Melanie Rose Duffy, Michael A Haney, Ayrton Stanley Kazee, Anna Kathleen Pierce, Kyle Joseph Ransom, Abby Rose Schatzman, Jack Patrick Talaga

**ADVISORS** Janet R Leonard, Vincent C Lewis

**LOCATION, TIME** Miriam Hall 209, 1:20-1:40

Flyer Enterprises is the fourth largest student run business in the nation. The current executive team will present our business model and their passion and purpose for FE and the Dayton community.

### Flyer Consulting: Past, Present, & Future

School of Business Administration: Crotty Center for Entrepreneurial Leadership

Oral Presentation - Independent Research

**PRESENTERS** Morgan Rose Eifert, Stephen Key Harvey, Eric William Mullet, Chloe Elizabeth Voelker

**ADVISORS** Vincent C Lewis

**LOCATION, TIME** Miriam Hall 214, 2:20-3:00

Flyer Consulting is one of the University of Dayton's fastest growing organizations that continues to evolve each semester. Our team takes the knowledge and skills gained in the classroom, as well as individual real-world internship/job experiences, and puts it to practical use for nonprofit organizations around the world. This Stander Symposium will serve as a unique opportunity for audience members to hear from the management team, project leaders, and younger members of the organization.

### Empirical Research Presentations in Economics

School of Business Administration: Economics and Finance

Oral Presentation - Capstone Project

**PRESENTERS** Heather Ann Axton, Najm Olawale Babatunde, Luke Anthony Bir, Ian Joseph Blair, Mitchell Thomas Bloemer, Xavier Bonfiglio, Noah Duane Cable, Michael Thomas Callahan, Summer L Camper, Patrick Eugene Canning, Cameron Allen Cerbus, Xiangyun Chen, Andrew Benner Dewees, Michael Scott Dobak, Matthew Paul Forte, Jack F Glending, Dominick T Golubiewski, Trevor Austin Gonzalez, David William Graf, Kayla P Haberstick, Ryan J Harpst, Evan Mathew Heeter, Jason Henry Hessel, Connor Christopher Larkin, Despina Lawandi, Roy Daniel Lawrence, Geng Li, Wesley Lawrence Luvisi, Nathan Joseph Machel, Christopher Warren Mack, Samuel Jacob Mancini, Clare M Manion, Patrick Nathan Martinette, Tony Joseph Mazza, John Paul McNamara,

Emily Anne Michl, Eric J Nascone, Griffin Foster O’Gara, Julie Noelle Pochodylo, Tom Scott Pollock, Vidyaarathi Pugalenti, Reed E Rayburg, Zachary William Reid, Robert Paul Richardson, Naimeh Osama Saleh, Nicholas Anthony Salerno, Wyatt James Satre, Mitchell V Schleyer, Sarah Elizabeth Sepanski, Michael Robert Sernus, Joshua William Simpson, Alex Marie Stahanczyk, Benjamin Daniel Steinhart, Nathan Peter Stemen, Caroline Grace Stockglausner, Jacob G Strippy, Benjamin D Vasunia, Lucas James Wahlen, Changhan Wang, Jake Austin Warnica, Darian A Washington, Evan J Willmann, Yifei Wu, Yuhui Wu, Bennett Alexander Zynn

**ADVISORS** Nancy L Haskell

**LOCATION, TIME** Miriam Hall 109, 8:30-5:30

Four years of coursework culminate in a written and oral presentation of an empirical research project during the senior capstone course. Students apply economic theory and econometric techniques to analyze data in order to answer an original research question.

## Trends In Private Fixed Investment: And the 2008 Recession

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Bennett Alexander Zynn

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In recent years a number of financial economists have been concerned about the lack of growth in capital investments by business firms. In this study I look at the intermediate and long term trends in private fixed investment (PFI) to determine if the severe recession in 2008 has altered business investment growth. Since PFI is divided into structures, equipment and intellectual property (e.g. computer software), it is important to evaluate these sub category trends as well. My research design is as follows; 1) I develop linear trend equations for the periods between time periods 1999-2007 and 2009-2017 to determine if the regression coefficients are significantly different. I test the hypothesis that the b coefficients for the 1999-2007 period are greater than the b coefficients for the 2009-2017 period, 2) I run linear regressions for the complete period of 1999-2017 and include a dummy variable  $D_1$  and set it equal to one for the 4 quarters in 2008 to determine if there is a downward shift in the regression line due to the 2008 recession, 3) Finally, in the 2009-2017 period there is evidence of a pick-up in both gross domestic product and gross domestic income over the latter half of this period. To see if there is a structural shift upwards in the regression line, I add a second dummy variable,  $D_2$  and set it equal to one for the 12 quarters in 2015, 2016, and 2017. I test the hypothesis that an extremely low unemployment rate, steady employment growth and low interest rates have combined to cause an upward shift in private fixed investment in recent years.

## The Inverse of the Coefficient of Variation as a Portfolio Weighting Factor: An Empirical Analysis of Returns for the Consumer Discretionary Sector 2019-2017

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Emily Marie Teutsch

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Portfolio stock weights based on the mean-variance proposition suggests that investors for any given level of risk will attempt to maximize returns and for any given level of return, will attempt to minimize risk. In this study, I used the inverse of the coefficient of variation (COV) as a proxy for the investor’s return/risk ratio. Using  $1/COV$ , I develop portfolio stock weights for the 20 top stocks by market value in the SPDR Consumer Discretionary sector ETF (XLY). I give higher weights to stocks with higher return/risk ratios and rebalance these ratios annually. I use a 3-year moving average of stock returns to capture the return/risk ratios. Performance is calculated for the years 2009-2017. The benchmark is the S&P 500 SPDR ETF SPX.

## U.S. Inflation Trends and the 2008 Recession

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Alison M Berry, Carmen May DeRose

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The U.S Federal Reserve Board uses long term inflation trends and projections to guide its policy decisions on controlling inflation. The objective of this study is to determine if the severe recession in 2008 altered the long term trend in inflation. Using the Consumer Price Index (CPI) as well as the Personal Consumption Expenditure Index (PCE) for our measures of inflation, we first divide the overall period of analysis into two nine year periods, 1999-2007 and 2009-2017, with 2008 the inflection point. Using linear regression with time as the independent variable, we develop regression coefficients (B) for both nine year periods and test the hypothesis that the 1999-2007 B coefficient is larger than the 2009-2017 B coefficient. If the hypothesis is correct, the difference in the B coefficients can be considered a proxy for the 2008 recession effect on trend inflation. We also run another test where a linear regression is run for the complete period but a dummy variable,  $D_1$ , is added to the equation line with  $D_1=1$  for the 12 months in 2008. We test for a negative coefficient attached to  $D_1$ , which indicates a downward shift in the regression line and provides

another measure of the effect of the 2008 recession on the inflation trend. Finally we test for a Phillips Curve effect on inflation trend in the 2009-2017 period. With U.S. unemployment reaching a rate around 4% during the last third of the 2009-2017 period, we run another trend regression but add the dummy variable D2 for the months in 2015, 2016, and 2017, in order to test for an upward shift in the inflation regression line. A positive coefficient attached to D2 would suggest the presence of the Phillips Curve effect.

### Investing in S&P 500 Stocks: Do Size and Value Still Matter

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Margaret Eileen Schutter

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Empirical research by financial economists show that small cap stocks outperform large cap stocks and value stocks outperform growth stocks over long periods of time (20 years or more). In this study, I extend the previous research by examining returns to portfolios based on size and value but over a much shorter time period, 2009 – 2016, to determine if the traditional outperformance patterns still hold. The 2009 – 2016 period is important because it includes the market rebound from the 2008 recession and has all the appearances of a long run bull market. It is also impacted by one of the most aggressive monetary easing policies in U.S. history. The universe of stocks is the S&P 500. Portfolios are rebalanced yearly.

### A Fundamentals Based Portfolio Weighting Model for the Information Technology Sector: An Empirical Analysis: 2009-2017

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Sallie Rebecca DeYoung

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

A central proposition in finance theory is that investors are risk averse and attempt to minimize the risk relative to expected returns regardless of the particular asset class being considered as an investment. In this study, I combine a fundamentals-based approach to portfolio weighting with a measure of return relative to risk to generate portfolio performance for the Top 20 Stocks by market value in the SPDR Information Technology Sector. I use a three-year moving average of each stock's earnings per share to calculate the inverse of the coefficient of variation (1/cov), a return-risk ratio. Higher portfolio weights are given to stocks with higher 1/cov ratios. Stock weights are recalculated each year so that the portfolio is rebalanced annually. The initial investment is \$1,000,000. Portfolio returns are generated for the years 2009-2017 and the performance benchmark is the SPDR S&P 500 ETF (SPY).

### Technical Analysis and S&P 500 Sector Returns, 2010-2016

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** John Tausch Gizzie

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The efficient market hypothesis suggests technical analysis has no role to play in determining stock or portfolio returns. In practice, however, a large number of investment managers employ technical analysis to generate excess returns or alpha relative to the market. In this study, I test an intermediate, to long-term horizon technical analysis measure, the 200 day moving average (MA200), to determine if it generates portfolio alpha. The top ten stocks by market value in the SPDR sectors Consumer Discretionary (XLY), Information Technology (XLK), and Health Care (XLV) are treated as stock portfolios and each stock's MA 200 is used as the portfolio weighting metric. The weighting decision rules are: (1)  $P > MA_{200}$  receives higher weights and (2)  $P < MA_{200}$  receives higher weights. The period of analysis is 2010-2016 and the benchmark is the S&P 500 ETF (SPY).

### Gross Domestic Income and Stock Returns: An Empirical Analysis, 2009-2017

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Michael Anthony Capicotto, Evan J Willmann

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Most financial economists agree that macroeconomic factors, as exogenous variables, must be included in asset pricing models in order to explain the variation in expected returns. In this study, I test the hypothesis that Gross Domestic Income (GDI) explains stock market price movements over time. I use linear regression analysis to identify the covariation between GDI and the top ten stocks by market value in the following SPDR sectors; (1) Healthcare, (2) Consumer Discretionary, (3) Information Technology, and (4) Industrials. Based on the regression coefficients (B), I develop portfolio weights for the stocks within each sector, with higher

weights given to stocks with higher B coefficients. Assuming a \$1,000,000 investment in each sector portfolio, I calculate returns for the years 2009 - 2017. I also calculate out of sample returns for the first two months in 2018. The benchmark portfolio used to determine excess returns is the SPDR ETF SPY.

### **Size, Value, and Profitability in the Cross Section of Returns: An Empirical Analysis, 2008–2017.**

School of Business Administration: Economics and Finance  
Poster - Independent Research

**PRESENTERS** William Binnie

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In this study I extend the analysis of Fama and French and Novy-Marx on the effect of firm size, value and profitability on a portfolio's excess returns. The period analysis is 2008 -2017. For this analysis I use the same metrics for size (market value) and value (price to book) as Fama and French but differ in my measure of profitability. I use return on invested capital (ROIC) instead of return on equity or gross operating profits as a percent of assets because ROIC is considered a better measure of measure of the efficient allocation of capital as well as the firm's ability to generate economic value added. I test the following hypothesis. 1.) High ROIC large cap stocks outperform low ROIC large cap stocks 2.) High ROIC small cap stocks outperform low ROIC small cap stocks3.) High ROIC value stocks outperform low ROIC value stocks4.) High ROIC growth stocks outperform low ROIC growth stocks

### **Trends in Retail Sales Pre and Post 2008 Recession**

School of Business Administration: Economics and Finance  
Poster - Independent Research

**PRESENTERS** Luke Anthony Bir

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

One of the key indicators of the robustness of consumption spending in the U.S. economy is retail sales. In this study, I look at long term trends in retail sales, both pre and post the 2008 recession to determine if the sales trends have been materially altered after the 2008 recession. Using regression analysis, I develop time-trend regressions for two time periods 1999-2007 and 2009-2017. I test the hypothesis that the regression B-coefficient for the 1999-2007 period is larger than the B-coefficient for the 2009-2017 period, with the difference a proxy for the recession effect on retail spending. I also look at the e-commerce component of retail sales and carry out the following analysis: (1) I develop trend regressions for e-commerce sales pre and post 2008 recession and (2) I develop trend regressions for the ratio of the e-commerce sales to total retail sales pre and post 2008 recession. I expect the e-commerce B-coefficients to be larger after the 2008 recession.

### **A Smart Beta Portfolio Model fo the SPDR Healthcare Sector: An Empirical Analysis, 2009-2017**

School of Business Administration: Economics and Finance  
Poster - Independent Research

**PRESENTERS** Casey (Patrick) Casey Marsh

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In recent years a large number of Exchange Traded Funds (ETFs) have opted for fundamentals based portfolio stock weights rather than equal-weighted or market value weighted. Fundamentals-based weighting models are often referred to as smart beta models because they create stock betas more closely aligned with a stock's intrinsic value. In this study I developed a smart beta portfolio weighting model for the SPDR Healthcare Sector. I selected the top 20 Healthcare Sector stocks by market value as my test portfolio and based on a three year moving average of earnings per share I generated portfolio weights using the inverse coefficient of variation (1/Cov). Since (1/Cov) is essentially a return-risk ratio, I gave higher weights to stocks with higher return-risk ratios. The portfolio weighting model is re-balanced annually. Portfolio Performance is calculated for the years 2009-2017 and the benchmark is the S&P 500 ETF (SPY).

### **Smart Beta Modelling : The Case for Cyclically Adjusted Price/Earnings Ratios**

School of Business Administration: Economics and Finance  
Poster - Independent Research

**PRESENTERS** Nicholas Christopher Jacobs, Dan Edward Wollenberg

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Schiller's Cyclically Adjusted Price/Earnings Ratio (CAPE) has been used by financial economists to determine the direction of the stock market, up or down. In this study, we develop portfolio weighting models with CAPE as the weighting factor. We use two

weighting decision rules: 1.) Higher weights are given to stocks with higher CAPE ratios and, 2.) Higher weights are given to stocks with lower CAPE ratios. The top ten stocks within the Consumer Discretionary, Consumer Staples, Industrials, Healthcare, and Information Technology sectors are used to test the alpha generating capability of the CAPE weighting factor. The returns for CAPE weighted portfolios are calculated for the years 2010-2016. The benchmark portfolio is the S&P 500 ETF SPY.

### **A Smart Beta Portfolio Model for the SPDR Industrial Sector: An Empirical Analysis, 2009-2017**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Will Luis Perez

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Based on Rob Arnott's foundational work on using stock fundamentals to weigh portfolios of stocks, I developed a smart beta portfolio weighting model for the top 20 stocks by market value in the SPDR Industrial Sector. The model uses a portfolio weighting factor based on the coefficient of variation (COV). In essence, a stock gets a higher weight if the  $1/COV$  (the return-risk ratio) is higher compared to other stocks. A three year moving average of earnings per share is used to calculate the return/risk ratio for each stock. The return-risk ratios are updated yearly with actual portfolio returns generated for the years 2009-2017. The performance benchmark is the S&P 500 ETF (SPY).

### **Forecasting U.S. Inflation**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** John Martin Harmon

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The U.S. Federal Reserve relies on a target rate of inflation of 2% to determine monetary policy actions regarding raising or lowering the federal funds rate. If the actual rate of inflation is above 2%, a tightening of monetary policy usually occurs. Conversely, an inflation rate below 2% can lead to a policy of monetary easing. The purpose of this study is to develop a time trend forecasting model of inflation to determine if expected inflation rates are above or below the target rate. Using CPI and CPI less food and energy as the measures of inflation, forecasts are made on a monthly basis for both 2017&2018. The forecasts for 2017 will determine the forecast accuracy of the regression models and the forecasts for 2018 will provide comparisons to the benchmark 2% target rate. The Root Mean Square Error (RMSE) is used to measure forecast accuracy. The time trend regression models are fitted to the monthly CPI data for 2009-2016 and 2009-2017.

### **Lending Club's Note Trading Platform Facade: An Examination of Peer-to-Peer (P2P) Lending Secondary Market Inefficiency**

School of Business Administration: Economics and Finance

Oral Presentation - Honors Thesis

**PRESENTERS** Stephen Key Harvey

**ADVISORS** Tony S Caporale

**LOCATION, TIME** Miriam Hall 209, 1:00-1:20

Peer-to-Peer (P2P) lending is the practice of matching borrowers and lenders through a third-party, such as Lending Club, allowing for lenders to pool their funds together to match the need of a borrower. Those who pledge funds to a borrower receive a note proportional to their invested amount. After a loan closes, lenders may choose to sell their notes on a secondary market. These secondary markets allow for the lender to set a price and auction their notes. Through an analysis of Lending Club's secondary market (Note Trading Platform), it can be determined that this method of price setting often causes prices to be misaligned to the true value of notes. This results in an inefficient secondary market where the majority of notes posted for auction are never purchased; leaving lenders with a potential level of liquidity that is not met.

### **SBA BESST Program - Highlights & Discussion Business Experience San Fransico & Silicon Valley A Unique & Robust Intersession Course and Program**

School of Business Administration: Management and Marketing

Panel Discussion - Course Project, 201780 MKT 494 N1

**PRESENTERS** Katie Ann Dombrowski, Giavanna Marie Facchiano, Alex Anthony Geiger, Emily M Lawton, Katherine Elise Olifrowicz, Myra Lee Peterson, George Albert Sechrist, Rehan Amin Syed, Andrew Szappanos, Emma Catherine Welge, Nicolette Ann Westberg

**ADVISORS** Irene J Dickey, Tracy K Miller

**LOCATION, TIME** Miriam Hall 101, 1:00-2:00

UD is about community and that community extends well into a robust business community of alumni working at amazing

companies in San Francisco and Silicon Valley. Join the students who visited 13 companies including Fit Bit, LinkedIn; Google, Tesla, NASDAQ and Salesforce. This program brings their intercession experience to life with a video presentation and a Q & A. Follow-up work includes reflection work and a video project highlighting Alumni Leaders, company visits, events with Alumni Leaders, and other excursions. Students will share their experiences visiting with alumni and their colleagues and touring these companies. They will discuss their insights into networking events, meaningful discussions with alumni leaders, tours, and the network and community they built with the professionals they connected with!

### Flyer Angels: A Student Run Angel Investment Fund

School of Business Administration: Management and Marketing

Panel Discussion - Independent Research

**PRESENTERS** Brandon Robert Braun, Maddie Walker Collins, Amy Elizabeth Nolan, Todd Richard Price, Jen Marie Rondinelli, Jack Patrick Talaga

**ADVISORS** Jay J Janney

**LOCATION, TIME** Miriam Hall 209, 1:40-2:20

Flyer Angels at the University of Dayton is one of 5-10 programs in the United States where undergraduate students make investments in technology-based startup companies. Students manage a 7 figure portfolio, with investments in four angel funds and 8 portfolio companies. Students analyze companies, conduct a due diligence analysis, and vote on providing funding to technology-based start-up companies. Currently students have invested \$50k in Ohio Tech Angels Fund V, which raised \$6 million. As members of fund V, students 4 times this year have joined an investment team of 8-10 individuals, who develop an investment proposal to all Fund V members. Typically they approve providing \$250k investments from the fund, and students can invest an additional \$10k-\$25k in any investment deal they think merits an additional investment. Each year Flyer Angels selects 6 junior and senior entrepreneurship majors to form the following year's team. It's a paid position. Teams meet each week to discuss the current portfolio, conduct due diligence on investments they seek to make, and develop a funding proposal for deals they seek to make. In this session we'll ask this year's members to discuss their experiences, what they like and what surprises they have found. The audience is encouraged to ask questions as well.

### OPS 495 Capstone Project Presentations (Part 1 of 3)

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Bridget Marie Bittner, Ian Joseph Blair, Mateo Mateo Chavez, Abigail Catherine Dalton, David Addison Delworth, Brandy Alivia Gibson, Peter James Kania, Robert Cameron Kennedy, Brendan Christopher Kimes, Daniel Marquez, Jack Liam McHugh, Charles Gerald Reinhardt, Jack Elliott Schell, Daniel Eric Warner

**ADVISORS** Michael F Gorman, John J Kanet, Robert A Kinion

**LOCATION, TIME** Miriam Hall 103, 11:00-12:00

Senior Operations and Supply Management majors present the results of their Capstone Projects.

### MIS Capstone Midmark Information Technology Operations Dashboard

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Armando Alonso, Seth N Bensman, Boyu Fan, Kara Ayanna Goodwin

**ADVISORS** Stephen Russell Hall, Sukhdev Nanda

**LOCATION, TIME** Miriam Hall 207, 1:00-1:30

MIS Senior Capstone Project For Midmark, our goal is to create a live dashboard that incorporates various desired IT metrics to be displayed on TV monitors and made accessible from a network connected PC. An electronic dashboard is the desired final outcome that pulls data from sites used by Midmark to benefit their IT team when working within the company. Midmark traditionally uses waterfall methodology but is transitioning towards agile method. That being said, we as a team are going to use an agile method to go along with their current trend within the company. We will be working directly with Jeff Reed for the project and contact but there will be others from various departments in Midmark who help us determine what is useful or not when it comes to the design of the dashboard. Our current idea for creating the dashboard is to use an external program such as PowerBI or Smartsheets, which pull data from numerous sites allowing you to put different metrics into a dashboard while it updates in real time.

### OPS 495 Capstone Project Presentations (Part 2 of 3)

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Sean Andrew Alexander, Steven Phillip Almeida, Breanne Marie Beitman, Yihan Cai, George Breen Cleary, Alyssa Frances Giese, Joseph Michael Ginley, Alayna Ashley Gornic, Sarahjane Hannibal, Christopher Patrick Harrison, Devin Michael Joss, Mary-Beth Elizabeth Macklin, Kayla Jane McLaughlin, Matthew E Moore, Nicolas A Paxson, Anne Marie Whalen, Zachary Robert Wilker

**ADVISORS** Michael F Gorman, Robert A Kinion



**LOCATION, TIME** Miriam Hall 103, 1:00-2:00

Senior Operations and Supply Management majors present the results of their Capstone Projects.

### **MIS Senior Capstone Project Wright “B” Flyer Quickbooks & Point of Sale Implementation**

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Laylah Victoria Funk, Stephen Key Harvey, Lydia Noel O’Connell, Benjamin Joseph Warpinski

**ADVISORS** Stephen Russell Hall

**LOCATION, TIME** Miriam Hall 207, 1:30-2:00

MIS Capstone Wright “B” Flyer Project Description The University of Dayton MIS Capstone Team, consisting of Laylah Funk, Stephen Harvey, Lydia O’Connell, and Benjamin Warpinski, will be working with Jay Jabour from Wright “B” Flyer Inc. to consult on a variety of areas, as described below: Aid in the migration of Quickbooks into the main Wright “B” Flyer Inc. office location? Build processes to extract relevant financial data from Quickbooks, in order to calculate a variety of metrics as defined by Wright “B” Flyer Inc.? Perform limited analysis for the past 3 years of Wright “B” Flyer, Inc. financial data to inform the process recommended for future extraction of relevant data from Quickbooks going forward The University of Dayton MIS Capstone Team proposes to present 3 deliverables to Wright “B” Flyer Inc. throughout the Fall 2017 semester (September 2017 - December 2017). The 3 deliverables are as follows: a Baseline Project Plan, a Requirements Document, and a Design Document. Dates for these presentations will be set up as the semester progresses.

### **MIS Senior Capstone Project UDIT - Enhance Printing Services**

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** William Edward Doorack, Alex Joseph Formosa, Samuel Robert Parks, Michaela Jean Patsko, Jie Wang

**ADVISORS** Stephen Russell Hall, Merete Hvalshagen

**LOCATION, TIME** Miriam Hall 207, 2:20-3:00

UDIT approached our group in hopes of finding a solution to a few issues they were experiencing with the current print system on campus. Their overall goal at the culmination of the project is to develop a system to make printing services at the University of Dayton more efficient, cost-friendly and sustainable while at the same time streamlining the process into one cohesive workflow. While this is the main backdoor objective, UDIT has also asked we boost marketing for this new system to increase awareness of the managed print system and to ensure that faculty and students feel more comfortable using it. The issue UDIT is facing centers around its managed print system, which has multiple different components. The first deals with the way people print on campus. There are currently two options, the managed print program which the university pays a service for, and the HP printers located in each faculty department. Our goal here is to find how cost effective it would be to eradicate all of the older HP printers and rely solely on the managed print service. Another issue they are facing, which is not as pressing as the first, centers around the contract UDIT currently has with Pro-Source will expire sometime in the middle of next year. Our goal here is to make sure that this company is providing the most cost effective service and no other competitors in the industry can offer any better. Our final task assigned to us by UDIT was to clean up current database of department codes within each of managed print printers to ensure each printer is specifically dedicated to a certain area on campus or department. Currently there are a myriad of codes on various different printers around campus that have not been cleaned up in the past 5-10 years. Cleaning up the codes will make the new system working process more easy to track, and create a database record every printing task. Rectifying all of these issues will achieve UDIT’s goal of creating a more streamlined, cost-effective, and energy efficient printing service at the University of Dayton.

### **OPS 495 Capstone Project Presentations (Part 3 of 3)**

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Luke Joseph Bick, Kailee Ann Budicin, Stacy Nicole Cruze, Jing Dang, Kristina Sara Depaola, Andrew Thomas Fenlon, Connor T Hemmelgarn, Wallace James Huggett, John J Kanet, Nick X Mangan, Dieter F Manke, Nathan Jacob Marotta, Hannah Eden Odzer

**ADVISORS** Michael F Gorman, John J Kanet, Robert A Kinion

**LOCATION, TIME** Miriam Hall 103, 2:20-3:20

Senior Operations and Supply Management majors present the results of their Capstone Projects.



**SCHOOL OF EDUCATION AND HEALTH SCIENCES**

organized by department/start time

## Job Searching for Higher Education Students in a Highly Digitized World: The Role Social Media Plays in Finding a Full-Time Position

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Course Project, 201780 EDC 540 D1

**PRESENTERS** Brittany Ann Fishburn

**ADVISORS** Graham F Hunter

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This project aims to explain the role that social media plays in college students finding a job upon graduation. It addresses whether or not recruiters and organizations use social media as a viable method to fill open positions. It also conveys whether or not LinkedIn is still a relevant social media platform and if other social media outlets, such as BeBee, can be used for the job search process. The research was conducted by synthesizing information from peer-reviewed scholarly articles for a graduate course at the University of Dayton titled EDC 540 Perspectives in Higher Education. In the end, it is clear that social networking should not be ignored during the job search. Recruiters are utilizing social media to conduct a pre-check on candidates, post jobs, and make connections with potential candidates. Despite the popularity and usefulness of social networking sites for student to find a full-time position, traditional internet job boards, such as careerbuilder.com and indeed.com are still a top priority (Nikolaou, 2014). Essentially, social networking sites are important to utilize, but should only be one of the many tools used when looking for job opportunities. Keywords: LinkedIn, Job Search, BeBee, Social Networks

## Perceptions of Short-Term Study Abroad Experiences on Intercultural Competence in School Psychology Graduate Students

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Nicole Anne Guzman

**ADVISORS** Susan C Davies

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Intercultural competence is an emerging topic of interest in service-based professions, including school psychology. The National Association of School Psychologists has long asserted the importance of intercultural competent practices in schools in the form of ethical and unbiased assessments and interventions, collaboration with families, and overall justice and advocacy for all students. Research indicates that participating in a study abroad experience is an accessible option for future professionals in schools to gain intercultural competence. Previous research examined the impact of study abroad experiences on future teachers and school counselors, but little has been researched on the impact of study abroad on school psychologists, who serve diverse student groups. This qualitative project examined the unique experiences and perceived intercultural competence growth of school psychology graduate students who participated in study abroad experiences, as well as their perceived preparedness to serve diverse populations in schools. Implications regarding future research are provided.

## The Rainbow Connection: Fostering Inclusivity, Empowerment, and Advocacy for LGBTQ+ Students through Staff Professional Development & Student Psychoeducation

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Andrew Jay Rock

**ADVISORS** Brenda S Gerhardt, Layla J Kurt

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

LGBTQ+ students, an often overlooked group within our schools' diverse populations, have unique needs. This action research has been focused on these academic and social-emotional needs and the ways in which they can be addressed at the macro and micro levels. The intended objective of the research project was to explore ways to support LGBTQ+ youth in a heteronormative, and at times, homophobic educational environment. However, upon further investigation it became evident that, in addition to student psychoeducation and LGBTQ+ affirmative care, staff education and professional development are lacking in the schools. These findings have led to the creation of an ensemble of practical resources for students and school staff; a series of professional development workshops, and the initiation of an advocacy-based, fictional novel series for LGBTQ+ adolescents and the adults working with them.

## Religion and Mental Health: Does religion help or hurt our psychological well-being?

School of Education and Health Sciences: Counselor Education and Human Services

Oral Presentation - Course Project, 201752 EDC 568 81

**PRESENTERS** Adam Hall Brandt

**ADVISORS** Daniel J Trunk

**LOCATION, TIME** Kennedy Union 207, 11:30-11:50

Religion and Christianity play a significant role in psychological health and coping with depressive symptoms (Fox, 2004; Pargament,

Magyar-Russell, & Murray-Swank, 2005). The help-seeking behaviors religious people employ seem to have a positive effect on lowering depressive symptoms. However, not all the research pertaining to the relationship between depression and religion is quite black and white. Much discussion and nuance surrounds what specifically about religion helps to mitigate depressive symptoms. This research focuses on religion as it pertains to sects of Christianity (such as Catholics, evangelicals, Methodists, Lutherans, and Baptists). It does not focus on other religions that are similar to Christianity but are inherently distinct due to major conflicting beliefs about Jesus and salvation (such as Judaism, Islam, and Mormonism). The research focuses on religious people and attempts to find exactly what it is about religion that affects the psychological health of individuals, both in general and with major depressive disorders. The inconsistencies in the research are what drive this research proposal. Most research shows that religious involvement and salience positively impact mental health (Baker & Cruickshank, 2009; Den, 2006; Krause, 2010). However, the kinds of religious coping skills Christian people employ also can drive levels of self-mastery and self-esteem up or down, which then affect one's mental health in positive or negative ways (Newman & Pargament, 1990). There is also research that shows a U-shaped relationship between levels of religious salience and depression. This U-shaped relationship suggests that highly religious salient people face higher amounts of depression than moderately religious salient people (Schnittker, 2001). This research attempts to find common themes within the highly religiously salient group that could be contributing to their severity of depression.

## Evaluation of a School-Based Tier Two Anxiety Intervention: The Worry Box Technique

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Katrina Olimpia Aguenza Lazarte

**ADVISORS** Elana Renee Bernstein

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

School practitioners frequently learn about intervention strategies on websites, blogs, and social media, yet these strategies often lack empirical support. One such technique, the worry box, is a cognitive-behavioral strategy that may be implemented as a Tier 2 intervention for students with anxiety. This poster presentation will share the results of a study that examined the effectiveness and feasibility of the worry box technique for children with anxiety in a school setting.

## Living in the Slump: Second Year African American Undergraduate Students' Coping Mechanisms

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Cerelia Victoria Bizzell

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The sophomore experience has been characterized with not only academic difficulty, but also psychosocial challenges (Schaller, 2010). This study sought to describe and examine the many different experiences African American sophomore students encountered at a predominately White institution (PWI). Moreover, this study looked to understand the stress coping mechanisms they have adapted when balancing academics, social life, and extracurricular activities. The findings revealed that African American sophomore students have had difficulty learning to trust their institution's resources, have had a hard time balancing their social life, and have felt the need to mature faster than others. Incorporating a narrative study approach allowed students to reflect on their interpersonal and intrapersonal development, and give detail to how they dealt with the obstacles they faced during their second year. Future studies could focus on a particular gender in order to analyze the different stress coping mechanisms utilized by students.

## Agents of Change: Influence of Service Learning and Volunteerism on Career Choice among Military Personnel

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Marcia Mills Nehring

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Since 9/11, more is known in the field of College Student Affairs about how to support military students who transition into college. Engaging these nontraditional students in service learning and volunteerism has shown to influence career choice, increase completion rates, and strengthen community partnerships (Sims, 1989; Travor & Kates, 2014). With higher numbers of unemployment rates for this population, the purpose of this qualitative narrative research study is to explore the perspectives of military students and staff at a Community College in mid-western Ohio, whose career choices were influenced by volunteerism and service learning. The primary investigator used a confidential interview protocol. The findings could inform future studies and encourage community buy-in to engage military personnel in nonprofit activities that may influence their future career choices. Waddell (2011) says, "The significance of entire concept of community service or service learning is directly linked to their military core value of mission first and service before self" (p.18). This study adds to that conversation.

## High School Students + Vocation Education = Better Decisions? A Mixed Methods, Group Comparison Study of Students at a Midwestern, Suburban High School

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Julie M Huckaba

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Every year, students who have just graduated high school blithely begin their journeys through postsecondary education, some choosing two-year colleges, some embarking on degree paths at four-year institutions, and others choosing military service, apprenticeships, or work. The purpose of this mixed methods, group comparison study is two-fold: (a) to examine the difference between the pre and post Brief Calling Scale scores of high school seniors and juniors ( $n = 37$ ) exposed to the Ikigai/Vocation discussion workshop, and (b) to evaluate the influence of the Ikigai/Vocation discussion workshop on the postsecondary decisions of these students. The findings of this study increase our understanding of how student development relates to postsecondary decisions after being exposed to a Vocation workshop utilizing the Japanese concept of Ikigai and the intersection of Character Strengths -- 24 traits that all individuals possess in varying degrees.

## A Nationwide Study on the Impact of Racial Battle Fatigue on Black Student Affairs Professionals

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Beverly Auston Dines

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, online survey-based study is to explore racial battle fatigue and its impact on Black student affairs professionals across the United States. How do Black student affairs professionals describe racial battle fatigue and its impact on their professional lives? The findings enhance our understanding of the needs and opportunities for advocacy as it pertains to these professionals. The survey results are organized by theme and analyzed for trends and best practices.

## Data for our Students: How Three Large Public Universities Use Tech-Based Solutions to Foster and Track Student Success

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Ellen Elizabeth Marburger

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Using technological applications and databases for tracking student success in higher education is slowly becoming a necessity rather than a recommendation, especially at large campuses. This content analysis study sought to examine the breadth and depth of the use of these applications amongst three such universities in the midwest by analyzing and coding publicly available data around the themes of evaluation strategies, solutions, and communications. This study first examined the current commentary and research around this topic and defined student success indicators, identified three campuses, and finally compared the systems used, purposes for each, capabilities of each, and what gaps may still exist in the context of using such technology to assist in student success. Key findings suggest that this subset of the field is evolving, and widespread use and integration of these systems may be the next step for campuses and professionals, supplemented by future research.

## A Journey Towards Multiculturalism: Cultural Identity Development Among Chinese International Students

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Yuan Zhou

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

This is a qualitative, narrative research study examining the stories told by six undergraduate Chinese international students about their transitional journey from a monocultural to multicultural identity. In the interviews, students were asked to reflect on their understanding of self, Chinese culture, and American culture. Students were also prompted to reflect on their past experiences in China leading up to their arrival to the United States as well as those while attending the University of Dayton. The commonalities in their narratives showed evidence of internal motivation to immerse themselves in American culture, in addition to the negative and positive encounters with both Chinese and American students on campus.

## Understanding the Transition from Rural High School Student to Urban College Student

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Hannah Danielle Zimmerman

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, phenomenological study is to understand the transition from high school to college among first year, undergraduate students from rural communities at The Ohio State University. Through the conduct of interviews with 13 participants, I have been able to gauge how rural community high school graduates describe their transition into an urban university setting in one of Ohio's largest cities. Research has shown that students in rural communities are in the lowest of proportions on college campuses, and often it is because they are not exposed to the resources available to prepare for post-secondary education. In this study, students from rural communities have expressed feeling unprepared for college upon graduating high school, and lack of preparedness has been demonstrated through minimal challenging class offerings, unmotivated high school teachers, and not being a part of a college conversation prior to enrolling at the university. My interpretation of the data suggests that some of our rural students may not be exposed to and prepared for post-secondary education, indicating missed opportunities towards maximizing leadership potential and growth within our agricultural communities.

## They Succeed: Exploring the Academic Success of Undergraduate Black Males at the University of Dayton

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Breana Lynn Smith

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, phenomenological study is to understand the experience of African American male identity and its relation to the academic success of African American male junior and senior students at the University of Dayton. Following the African American identity development models of Cross (1971) and Robinson and Howard-Hamilton (1994) as theoretical frameworks, I explore factors related to African American male students' identities and how these subsequently influenced their academic achievement. The historical research about African American male students in higher education focuses on the deficits this population faces and ultimately feeds into the stereotypes that plague this group (Harper, 2009, as cited in Kim & Hargrove, 2013). Emerging research on the topic of African American male success within higher education has evolved within the last decade and has started to frame an achievement-based representation of Black male collegians. Data was collected utilizing individual, in-person interviews (n = 9) between the researcher and participants. Among my several findings, familial support, campus resources and support, and the desire to do better were top influences in these participants' achievement of academic success. Common among my findings was extracurricular involvement; this trend appeared as a high influence for many of the participants. The influence of African American male identity on the ability and desire of these students to succeed academically emphasizes the need for support and resources for this population within higher education and prior.

## Final High School GPA, What's the Big Deal?

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Katelyn Brohman

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

This quantitative survey-based study explores whether or not there is a statistically significant correlation between final-year high-school GPA and first-semester college GPA among undergraduate students at the University of Dayton. The purpose of this study is to determine whether or not a final high school GPA is related to success in college. It is not rare for high school students to believe their GPA in high school directly relates to their ability to succeed in college; as a high school teacher, I believe this is incorrect. We put so much stress on high school GPA only for some students to be under-prepared when arriving at college. This study also explores the difference between students' first-semester college GPAs based on their self-identification as (a) not at all confident, (b) somewhat confident, (c) confident, or (d) very confident about being successful in college before they started as undergraduates at the University of Dayton.

## Examining the Experience of Choosing a Major among First-Year, First-Generation, Undecided Undergraduates at the University of Dayton

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Adam Thomas Solomon

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Over half of all students who withdraw from college do so within their first year, resulting in a first-year attrition rate of over 25% at four-year institutions, and roughly 50% at two-year institutions (Cuseo, 2005). Undecided students and first-generation students represent two populations who are at the greatest risk of attrition. Since the 1980s, both populations of students have increasingly become the focus of study in the retention literature, and yet little has been written about the intersection of these two student characteristics. This qualitative, phenomenological study attempts to address this intersectionality by highlighting the experience of decision-making around choice of major among first-year, first-generation, undecided undergraduates at the University of Dayton. Data collected via one-on-one interviews with participants reveal their extrinsic and intrinsic motivations for choosing a particular course of study, how they conceptualize choosing a major based on post-college aspirations, concerns about being undecided, and key figures who helped guide them through the process of choosing a major.

### **Cross Cultural Connections: A Phenomenological Study of Intercultural Learning from Intercultural Living.**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Megan Jacoby Woolf

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Higher education administrators and student affairs staff on some residential campuses have attempted to be more inclusive of international students and their U.S. peers by creating co-curricular learning communities addressing intercultural living. Intercultural residential communities, like Cross Cultural Connections (CCC) at the University of Dayton, serve to support the transition to intercultural living for first-year students. Through eight interviews of former CCC residents, this qualitative, phenomenological study explored how the community cultivates intercultural competence. According to the Refined Developmental Trajectory of Intercultural Maturity (Perez, Shim, King, & Baxter Magolda, 2015), former residents of the CCC expressed varying levels of advancements of their intercultural competence. This study assesses the longitudinal success of the CCC's learning outcomes and gives suggestions for similar intercultural residential communities.

### **The Experience of Interaction With and Reporting To the Dean of Students Office among African American Law Students at a Private, Midwestern University**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Nikeya Lynn Sharp

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The Dean of Students office is a primary advocate for students, providing services and programming that support students in achieving academic and personal success. The office utilizes several departments that it houses as means to connect with and support students. These resources include the offices of Advocacy and Intervention, Community Standards and Civility, Sexual Violence Prevention Education, LGBTQ+ Services, and the Center for Alcohol and Other Drug Resources and Education. Methods for reaching out to and engaging students within each of these offices look different, but all of them include educational programming and unique supports for students. Ideally, these resources would be utilized by all students; however, there seem to be sub-populations of students who tend to take advantage of these services less frequently. One such sub-population is African American law students. Williams (2000) found that African Americans have difficulty reaching out for help from resources due to the fear of being labeled on top of current race related stigmas (p. 243). This purpose of this qualitative, survey research study is to explore the experiences of reporting to and interaction with the Dean of Students office, or reasoning for the lack thereof, among African American law students at private, religiously-affiliated, mid-sized, Midwestern research university. The findings of this anonymous online survey provide helpful indicators for how we can better support these students and ensure they are receiving adequate and equitable support. Having a case management position located within the university Law School could make students more inclined towards reporting concerns of crisis as well as feel more supported.

### **Soaring to New Heights: A Case Study of the AVIATE Program at the University of Dayton**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Keri Lynn Good

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The curricular approach to developing education in residence is becoming more common amongst Housing and Residence Life departments at colleges and universities because the approach is driven by research and assessment is unique to each institution, is intentional, and ultimately centered on learning (Brown, 2017). The University of Dayton implemented a residential education model in 2014 that tied learning in residence and learning from campus partners to the housing assignments process – a triad program

called AVIATE, or A Vision for Integrated, Applied and Transformative Education. The University of Dayton's curricular approach to residential education tied with the housing assignments process is unique, and thus the aim of this study was to highlight this initiative. This institutional case study analyzed the development and implementation of AVIATE through interviews with a sample of the professional staff members at the University of Dayton who helped to establish the program. Additionally, university documents, historical information and external contexts were analyzed in relation to AVIATE. Findings illustrate the chronological series of processes by which AVIATE was developed as well as conclusions on how the professional staff members' views on their role in student affairs has evolved as a result of working with a residential curriculum. Implications for future research include analyzing the student perspective and learning through participation in the AVIATE program.

### **And Give Me Support: How SUNY Institutions Address Employee Experiences of Burnout**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Conor Matthew Kutner

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this content analysis study is to uncover how higher education institutions in the State University of New York (SUNY) system offer support to higher education professionals in their employment who experience burnout during the course of their work. With the high attrition and turnover rates of higher education professionals (Rosser & Javinar 2003; Tull, 2006), institutions do not seem to be meeting the needs of their employees. This study will utilize a content analysis approach to systematically review the publicly-available literature such as employee handbooks, human resource websites, and employee wellbeing services websites from SUNY system institutions (n = 10). This study seeks to identify a multi-dimensional method (Abbott & Baun, 2015) of addressing these issues and needs, of providing support and services to employees, and to offer recommendations on best practices in responding to those need-specific gaps in future research and progress.

### **Exploring Undergraduate, International Student Retention at the University of Dayton**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Emily Mitolo Grasso

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, case study is to explore the challenges, responses and best practices of academic units in the retention of undergraduate, international students moving from their first to second year at the University of Dayton. The Deans' offices were surveyed (n = 4) and interviewed (n = 4) electronically, revealing that there are not current retention initiatives for this student population within the academic units. The findings will be shared with the units as well as other support services across campus who may be able to take action to increase persistence of undergraduate, international students past their first year.

### **Perceived Barriers to Reporting Incidences of Stalking by Undergraduate Students at a Private, Midwestern University.**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Antony David Parnigoni

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

One in six women and one in 19 men will be victims of stalking in their lifetime (Baum, Catalano, & Rand, 2009). This qualitative, phenomenological research study explores the perceived barriers to reporting stalking-related behavior that undergraduates self-report at a private, religiously-affiliated, mid-sized, Midwestern research university. Undergraduate students (n=22) were interviewed in a one-on-one setting. Barriers that have been recorded in past research have included fear of retaliation, uncertainty that a crime has been committed, or not wanting friends to find out (Fisher, Diagle, Cullen, & Turner 2003; Sable, Danis, Mauzy, & Gallagher, 2010). These previous findings are consistent with the findings of this study. In addition, the majority of students reported that the school could do more to educate on what constitutes as stalking behavior, what the reporting options are, as well as what happens after a report has been filed. These findings are relevant for any university because the research site in this study has already invested a great deal of resources into combatting partner violence and this evidence suggests that there will always be more opportunities for education and student engagement; in other words, this is an ever-evolving battle that needs to be fought.

### **Exploring the knowledge and attitudes toward concussions among college football players**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Ian James Chennell, Megan Irene Grace, Marissa Ann Melaragno, Jamie Grace Squillante

**ADVISORS** Haozhou Pu



**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There have been increasing concerns on the issue of concussion in the world of football. The concussion effects are becoming more evident as the players get older and the more technology grows. Because of this, we wanted to look into the knowledge level and attitudes about concussions. Our study looks at multiple college football players and what their knowledge level and attitudes are about concussions. We will measure this by conducting interviews and administering surveys based on "Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS)". We also took aspects of the Planned Behavior Theory and related them to our findings. The Planned Behavior Theory looks at an individual's drive and motivation to engage in a specific behavior. Specifically, we are interested in seeing if the knowledge level or attitudes about football among college football players would play a part in their athletic performance.

## **Interference of the Inflammasome Via Interferon-Beta**

School of Education and Health Sciences: Health and Sport Science

Poster - Honors Thesis

**PRESENTERS** Maddie Ann Sauer

**ADVISORS** Anne R Crecelius, Dr. Joel Schilling, M.D., Ph.D.

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

It is well established that macrophages, a classification of white blood cells, are the body's first line of defense against stressors such as bacterial and viral infections. The inflammatory response is adaptive and is the body's way of fighting anything that would be considered foreign, and therefore potentially dangerous to the human body. This project looks at metabolic diseases, such as obesity and type 2 diabetes mellitus (T2DM), and the pro-inflammatory phenotype. The pro-inflammatory phenotype is a physical manifestation of the molecular changes that take place due to the high fat environment associated with metabolic diseases. This inflammatory response has been associated with not only metabolic disorder, but also Alzheimer's Disease, atherosclerosis, autoinflammatory/ autoimmune diseases, gout, inhibited tissue repair and creation of tumors. This project aims to assess a specific protein called PPAR-Gamma that, when absent, has been shown to decrease this pro-inflammatory response. If the mechanism behind how this protein works to decrease the inflammatory response can be established, it could be used clinically to treat many of the inflammatory conditions. It is hypothesized that in the absence of PPAR-Gamma a signaling molecule called IFN-Beta is increased, leading to the anti-inflammatory response. It is unknown how IFN-Beta and PPAR-Gamma are linked mechanistically. Through this research, we hope to establish the link between these two molecules. If this novel mechanism can be established, it can be used therapeutically to decrease the pro-inflammatory response.

## **The Effect of Quadriceps Strength on Abnormal Movement Patterns After ACL Reconstruction; A Systematic Review**

School of Education and Health Sciences: Health and Sport Science

Poster - Honors Thesis

**PRESENTERS** Mark D Bugada

**ADVISORS** Anne R Crecelius, Mark Paterno, PT, PhD, MBA, SCS, ATC,

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The current literature is replete with evidence of quadriceps femoris strength deficits after anterior cruciate ligament reconstruction (ACLR), but there is a lack of clear understanding about its relationship to movement patterns following ACLR. Elucidating the role of quadriceps strength relative to movement patterns is a vital step for improving the rehabilitation process. As a systematic review, this study aims to identify, assess, and synthesize the evidence regarding the relationship between quadriceps femoris strength and abnormal movement patterns in patients after ACLR. To achieve this, PubMed and EBSCOhost (SPORTDiscus) databases were searched to identify studies for this review based on the following eligibility criteria: 1) available in English, 2) human subjects following an ACLR, and 3) original research examining the relationship between quadriceps femoris strength and dynamic movement patterns. From these criteria, the reviewed articles were selected, data was extracted, and results were synthesized to draw conclusions. This study found that the majority of the literature on this topic shows that quadriceps strength is related to abnormal movement patterns, with increasing strength leading to increasing in performance or decreases in asymmetry. However, the results yielded variable outcomes for lower dynamic patterns, such as walking gait, and patterns where body positioning has a greater impact on the results, like the horizontal hop and Y-Balance tests. The results of this systematic review increases understanding on the information in present literature on how quadriceps femoris strength deficits after ACLR affect movement patterns following ACLR. Understanding this relationship is vital for clinicians to develop and improve rehabilitation protocols to increase success in patient outcome.

Assessing Adequate Caloric, Macronutrient, and Micronutrient Intake in College Athletes of Various Sports

School of Education and Health Sciences: Health and Sport Science

Poster - Independent Research

**PRESENTERS** Hannah M Boyer, Ashley Briana Marolo, Abby Louise Vichill

**ADVISORS** Diana Cuy Castellanos

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Adequate micro- and macronutrient intakes are important for optimal athlete performance and recovery and decreased risk of

injury. However, research suggests collegiate athletes often have suboptimal intakes of calories and nutrients such as calcium, vitamin D and iron. The purpose of this study was to examine the actual dietary intake to estimated need of calories and micro- and macronutrients of collegiate athletes across different sports at a Division I private university. Athletes from football, cross country, volleyball and track competed a three-day food record and 7-day physical activity log. Resting metabolic rate was determined through indirect calorimetry using a Medgem. Caloric need for each athlete was determined by adding the resting metabolic rate, calculated METS from exercise training, and physical activity and thermic effect of food factors. Macronutrient need for each athlete was calculated using determined grams/kg +/-10% based on the sport and compared to the calculated calories to ensure appropriate macronutrient distribution. Lastly, micronutrient intake was compared to the RDA for gender and age. The information from each three-day food record was entered into the Nutrient Database System for Research to obtain measures of each athletes' calories and macro- and micronutrients consumed. Frequencies and Chi-square analyses were utilized to examine dietary adequacy across gender. Fourteen male and 8 female athletes participated in the study. All athletes were under the calculated need for carbohydrates with 31% not obtaining adequate fat and 36% under for protein. More than 50% were under the RDA for fiber, vitamin D and potassium. In terms of gender, girls were more likely than boys to be under for iron but over for fiber. In conclusion, nutrition education and careful dietary planning should be a focus within the college athletic arena to encourage adequate nutrient intake and optimal athletic performance.

### Motivation Factors that Affect the Usage of the Recreation Facility by College Students

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Megan Rose Ellis, Kelly Ann Evers, Samantha Kaye Isidro, Jac Nicole Reamsnyder

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Studies have shown that this current generation of young adults is one of the least active when compared to other age groups. Most of these young adults are college-aged students with busy, stressful lives who cannot find the time to use recreation facilities. A main issue in research is that physical activity has declined and that there are surrounding factors that influence this. This study will focus on the primary motivation factors for physical activity participation in hopes of highlighting what motivate college-aged students to prioritize their health and fitness. A survey will be conducted and sent out to students who use the recreation facilities at the University of Dayton. Specifically, we will focus on measuring a variety of motivation factors, which includes social reasons, health benefits, weight management, self-confidence, competition, etc. The research findings will not only help us better understand the motivations behind the physical activity participation among UD students, it will also be beneficial to the UD Campus Recreation by allowing them to better satisfy the needs of their student clients.

### ACL Reconstruction Graft Types and the Effects on Recovery Time in Young Adults

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Megan Marie Gusky, Chrissy Hannigan Marie Hannigan, Daniel Vincent Passafiume, Michael Louis Valenti

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This study focuses on ACL Reconstruction Graft Types and The Effects on Recovery Time of Young Adults. There has been a large increase in ACL tears amongst both males and females recently and there are multiple different graft types that can be chosen from for repair. These options include autografts and allografts. Autografts consist of using a tendon from the patient's own body, which could include: a patellar tendon graft, a hamstring graft or a quadriceps graft. An allograft involves using a tendon that is taken from a source outside of the patient's own body. A cadaver is a common source for an allograft. The different graft types can result in different recovery times. Quantitative data is used to see the correlation between the graft the subjects chose and the overall recovery time. Therefore, students currently attending the University of Dayton will be informed about this study and asked to volunteer if they have previously torn their ACL and have had surgery to repair it. The goal of this research is to figure out which graft type used in ACL reconstruction surgery leads to the quickest recovery for both males and females. This study assesses why the subjects chose the particular graft that they did, what their experiences were during the rehabilitation process, how long it took them to recover from surgery and if they still have any problems with their knee currently.

### The Effect of Music Tempo on Running Performance in College Students

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Christian Umberto Fay, Chelsea Renee Jones, Alexandra Nicole Malsch, Megan Estelle Murray

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This research aims to determine a relationship between music tempo and running performance. It has been concluded that the presence of music correlates with lower rating of perceived exertion and more positive affect than the absence of music (Hutchinson, Karageorghis, & Jones, 2014). The findings of this study would be of interest to any college student interested in learning whether his or her music choice can improve running performance. Participants will complete three, one mile runs, each with a randomly

assigned condition. The conditions include listening to fast tempo music, slow tempo music, or no music. The pace of a fast-tempo song is measured at 200 beats per minute and the pace of a slow-tempo song is measured at 70 beats per minute (Edworthy & Waring, 2006). Athletic performance will be assessed by measuring mile time, rating of perceived exertion using the Borg scale, and post-workout heart rate. We hypothesize that the higher-tempo music will result in the participant to perform better on their running pace. The study is in progress and the findings will be reported at the symposium.

## **The Effect of Music on Running Pace, Heart Rate and Rating of Perceived Exertion (RPE)**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Alyssa Kathleen Boman, Mitchell Leonard Hester, Olivia Kathleen Lizanich, Megan Elizabeth Nemecek

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The purpose of this study is to investigate how music affects different exercise variables. The variables that are being compared are running pace, heart rate, and the rate of perceived exertion. These variables will be compared when the subjects listen to music and when they do not listen to music during exercise. The goal of this study is to find out if music has a profound effect on overall athletic performance. This investigation is important for people who currently exercise often, those who are looking to lose weight as well as those who are looking to begin exercise programs for the first time. By comparing the effect of listening to music to the effect of not listening to any music on running pace, RPE and heart rate, both the benefits and setbacks of running with or without music will be presented. This, in turn, will allow us to find improvements for exercise/training and ways to improve running pace while keeping RPE low. In order to carry out this investigation, 20 students will run ½ mile while listening to “Call on Me - Ryan Riback Remix” on one day and run ½ mile without any music on a different day. Their ½ mile times, heart rate and RPE will be recorded each day following the run. The data will be collected from college students and the results will be compared. Once the data is compiled and analyzed, it will either confirm or deny the hypothesis that music will have a positive effect on running pace, heart rate and rate of perceived exertion.

## **Assessing the Use of Cooking Demonstrations on Healthy Eating Barriers in City Bus Riders**

School of Education and Health Sciences: Health and Sport Science

Stander Undergraduate Fellowship Awardee

Oral Presentation - Independent Research

**PRESENTERS** Julianne Marie Evans

**ADVISORS** Diana Cuy Castellanos

**LOCATION, TIME** Kennedy Union 211, 12:00-12:20

Previous studies suggest that food insecure persons experience barriers regarding produce preparation and consumption. These barriers include acceptability, accommodation, availability, accessibility, and affordability. Nutrition interventions have played a positive role in overcoming these barriers. The objective of this study was to determine the effectiveness of a cooking demonstration and recipe distribution intervention on five identified barriers at a fresh produce stand in an urban bus station. This was a quasi-experimental study. Cooking demonstrations and recipe distribution was provided over a four month period at the fresh produce stand. Bus riders who came to the demonstrations were provided a recipe and were asked to participate in a follow-up questionnaire. Consented participants were called one week after their visit and were asked to answer ten questions on the five barriers to preparing and consuming fresh produce. Additionally, open-ended follow-up questions were asked. Participants also indicated if they made the recipe. T-test and frequencies were utilized to identify barriers and compare means between participants who had and had not made recipes. A thematic analysis was completed on answers to open-ended questions. There was no significant difference between groups on the five barriers. Collectively, participants scored affordability lowest and availability highest. A common constraint for those who did not make the recipe was time. For those who did make the recipe, they indicated it was easy to follow. Continuing to develop appropriate interventions for identified barriers in convenient locations for participants is important to encourage fruit and vegetable consumption.

## **The Special Olympics and Globalization**

School of Education and Health Sciences: Health and Sport Science

Oral Presentation - Course Project, 201810 HSS 354 H1

**PRESENTERS** Eric R Schutter

**ADVISORS** Haozhou Pu, Peter J Titlebaum

**LOCATION, TIME** Kennedy Union 207, 1:30-1:50

This presentation talks about the history of the Special Olympics and discusses who started the event, where it originated, and what was the motivation behind its foundation. From there, it moves into looking at what advancements the Special Olympics made in order to appear on a global stage and their relationship with the International Olympic Committee, or IOC. This will show how the Special Olympics' involvement with the IOC leads to international growth as they are, most likely, the biggest reason the Special Olympics is able to grow on a global scale. Next, the presentation will discuss how the Special Olympics interacts with local governments. Much like the Olympics, the Special Olympics requires facilities where their athletes can perform. Do these countries build new facilities or use preexisting ones? Also, why do these nations choose to host the Special Olympics? Do they do it for the money,

the association of helping those with disabilities, or something else entirely? Finally, the presentation will discuss how the Special Olympics interacts with its sponsors and stakeholders. It will look at how the Special Olympics came to partner with their sponsors and how they helped the organization reach a global audience. It will also discuss why some of these sponsors chose to partner with the Special Olympics, whether it be for public image or something else entirely. The presentation will conclude by discussing the Special Olympics' relationship with the media, how they are portrayed, and how they connect with the fans and consumers.

### **NFL Roster Analysis of the 2017-18 season, characteristics of NFL players from smaller schools.**

School of Education and Health Sciences: Health and Sport Science  
Oral Presentation - Independent Research

**PRESENTERS** Christian Alec Searles

**ADVISORS** Jon K Linderman, Peter J Titlebaum

**LOCATION, TIME** Kennedy Union 310, 2:40-3:00

The NFL is made up of the best players from all over the world, but mainly from top tier-collegiate programs. This study will examine the roster composition of the 32 NFL teams from the 2017-2018 season, focusing on 63 players identified as coming from smaller or lower-tier athletic programs players. Of these players, 53 are on the active roster and 10 are on the practice squad. This presentation examines the frequency of players by position from this uniquely identified population, as well as the physical characteristics of this population in comparison to NFP roster players from more traditional football schools.

### **The History of Physical Education-Activity, Sport, and Related Disciplines: Stories for the Ages and Lessons from the Legends of Memorable Moments, Events, Trends, Tales, Phenomena, and Famous Women and Men: Their Teams and Times - From the Marianists to the Moderns: Year 12**

School of Education and Health Sciences: Health and Sport Science  
Poster - Course Project, 201810 HSS 275 01

**PRESENTERS** Abdulla Jaseem Hasan Alhosani, Alexa Christine Amato, Tanner Rea Ayers, Samantha Lynn Bagdasarian, Marisa Miceli Banke, Ryan James Barnes, Mary Elizabeth Bayer, Aidan Bean, Christi Michelle Begeman, Austin Bergman, John Brown, John Thomas Brown, Kailee Ann Budicin, Mark D Bugada, Zachary John Burneka, Austin Waide Cline, Trina A Coleman, Isabelle M Connolly, Melanie Hope Craft, Julianna Lillian Curry, Audrey Lynn Eisenmann, Kelly Ann Evers, Kelly A Fitzgerald, Nolan Joseph Francis, Monica E Friedl, Lenny Michael Froehlich, Kate S Galfano, Lance Paul Gaspar, Megan Elizabeth Gerrity, Adam Joseph Goettmoeller, Troy Grabowski, Megan Irene Grace, Matt Mark Groeber, Kayla P Haberstich, Tate Joseph Hagan, Connor Anthony Hanson, Bauer Daniel Harris, Max Anderson Hawthorne, Nathan Thomas Helfferich, Kylie Renae Huesman, Brantley B Johnson, Quin George Kane, Mattea Kilstofte, Benjamin Klocke, Jessica Marie Koverman, Henry A Kuechly, Shane William Lefever, Justin T Longbrake, Reilly Alexandra Madsen, Keegan Michael McCafferty, Samantha Marie McDermott, Kevin Patrick McNamara, Alex George Medich, Jack Francis Monahan, Brandon Paul Moore, Josh Jacob Nixon, Tyler P Obear, Kayla Pariser, Lydia Christine Payton, Jamie Lynn Peterson, Tiaera Phillips, Sierra Bianca Pla, Sara Emily Robertson, Trent D Rothert, Alexandra A Rubin, Danielle Marie Ruffolo, Benjamin Nicholas Schmeusser, Brandon Michael Smith, Kelly Marie Sonnefeld, Christine E Szabo, Jake Edward Thomas, Alec N Trautman, Michael Joseph Turner, Samuel Tutu, Lauren Nicole Van Oss, Kyle Vassilo, Robert Joseph Wagner, Diandra A Walker, Jack Christopher Walsh, Marie Theresa Weckesser, Ellison Wenzinger, Tre Alexander Whittaker, Meghan E Wilke, Connor Redmon Wilson, Takahiro Yamada

**ADVISORS** George M DeMarco

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The purpose of these studies was to describe/interpret major events, trends, phenomena, and the lives and times of significant individuals in the history of sport and physical education-activity throughout the millennia. Interesting, inspirational, edifying, and enlightening, the stories told by the Teaching Assistants (N=11) and students (N= 60) of two (2) separate sections of the course HSS 275 - History of Physical Education/Activity and Sport – during the spring semester of 2018 speak powerfully to the transcendent nature of sport and physical activity across all generations, cultures, and topical interests. This year's project titles include: 1.The History of the Department of Health-Physical Education-Sport Science at UD: 1850-20182.John F. Kennedy's Influence on Physical Fitness and Sport: 1960-19633.The History of Women's Baseball4.The Life and Times of Rick Ankiel: A Comeback Story5.The Life and Times of Jim Spoerl: A Flyer ForeverThese original research projects utilized an array of primary and secondary sources, including interviews, personal narrative, documents, print media, photographs, artifacts, and vintage video to bring alive the past to teach anew life's lessons from the worlds of sport and physical activity to inform, inspire, enlighten, and edify attendees of the 2018 Stander Symposium.

### **The Effectiveness of a Personalized Peer Health Physical Education Program (PPHPEP) on the Health Related Physical Fitness, Diet, and Attitudes Toward Wellness of Students Enrolled In A University Personal-Community Health Course**

School of Education and Health Sciences: Health and Sport Science  
Poster - Course Project, 201810 HSS 117 01

**PRESENTERS** Christi Michelle Begeman, Zachary John Burneka, Lenny Michael Froehlich, Megan Elizabeth Gerrity, Troy Grabowski, Megan Irene Grace, Reilly Alexandra Madsen, Kevin Patrick McNamara, Alex George Medich, Michael Joseph Turner, Samuel Tutu, Ellison Wenzinger, Tre Alexander Whittaker

**ADVISORS** George M DeMarco

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The purpose of this major course research project was to determine the effectiveness of a Personalized Peer Health Physical Education Program (PPHPEP) on the cardiovascular endurance, muscular strength/endurance, flexibility, diet, and attitudes toward wellness of students enrolled in a university personal and community health course (N=11). In the spirit of pioneering exercise physiologist and researcher T.K. Cureton, who believed that the “true laboratories in physical education [were] the pools, playfields, gymnasiums . . .,” this study was field based and conducted primarily at the University of Dayton RecPlex. During the 2018 spring semester, students in one section of an undergraduate Personal Community Health course offered in the Department of Health and Sport Science exercised w/peers during 5 separate sessions. Team members participated in five (5) sessions conducted during class time and five (5) sessions conducted outside of class. Two of the (2) sessions included pre- and post-testing. All in exercise and testing sessions were conducted at the University’s RecPlex. Data from Pre and Post Test Fitness Testing Sessions were analyzed and compared using descriptive statistics. Qualitative data from students’ weekly Health Wellness Review Reflections (HWRR) were analyzed and compared to Insell-Roth (2016) Dimensions of Wellness Theoretical Framework to determine the effectiveness of the PPHPEP. Note: Data analysis for the PPHPEP is a Work in Progress (WIP)

## Youth Sport Concussion Management

School of Education and Health Sciences: Health and Sport Science

Poster - Independent Research

**PRESENTERS** Dell James Stover

**ADVISORS** Corinne M Daprano

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Concussions have become one of the most talked about health concerns at all levels of sport in the past several years. While much of the attention on this issue has been directed at the sport of football and the National Football League (NFL) in particular there has been growing awareness in the sport community that the risks of concussions extend to head injuries in all sports. Yet, in a report compiled by the Institute of Medicine (IOM) and National Research Council (NRC) of the National Academies on concussions in youth sports, researchers argued that “...much remains unknown about the extent of concussions in youth; how to diagnose, manage, and prevent concussions; and the short- and long-term consequences of concussions as well as repetitive head impacts that do not result in concussion symptoms” (IOM Brief, 2013). Overall there has been an increase in the number of reported youth sport concussions over the last decade. “From 2001 to 2012, the rate of ED [emergency department] visits for sports and recreation-related injuries with a diagnosis or concussion or TBI [traumatic brain injury], alone or in combination with other injuries, more than doubled among children (age 19 or younger)” (Centers for Disease Control and Prevention, 2017). Some researchers surmise that this increase in concussion reporting may be the result of more education and greater awareness of the symptoms of concussion on the part of athletic trainers, athletes, parents, coaches and athletic administrators. The purpose/objectives of this study are: 1) to examine parent’s knowledge and attitudes toward youth sport concussions; 2) to examine youth sport coaches knowledge and attitudes toward youth sport concussions; 3) to compare and contrast the knowledge and attitudes of parents and youth soccer coaches; and, 4) to provide recommendations regarding parental and youth sport concussion management education.

## The Effects of Oral Rehydration Solutions (Sports Drinks) on Strength, Speed, and Endurance - A Field Study

School of Education and Health Sciences: Health and Sport Science

Poster - Honors Thesis

**PRESENTERS** Andrea Lynn Wisniewski

**ADVISORS** Jon K Linderman

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project will study the effects of orally consumed sports drinks on physical performance on field-based tests. Dehydration happens quickly during intense exercise in hot, humid environments. Mild dehydration, noticed by a 2% drop in body weight, can cause a decrease in performance. Intense dehydration, a 10% drop in body weight, causes death. Because athletes and military personnel experience dehydration on a regular basis, having a better understanding of the best sports drinks will lead to better rehydrating programs and potentially save lives. Most sports drinks contain carbohydrates and ions to refuel the body after it burns through its endogenous stores. Gatorade, the most popular commercially available drink, is mostly table sugar, salt, and potassium. This study will into how if CeraSport can prevent dehydration better than Gatorade. CeraSport is not commercially available and uses rice-sugar instead of table sugar. By putting athletic, college-aged men through a series of field tests over three consecutive weekends and feeding them just an ion drink with no sugar, Gatorade, and CeraSport, will help demonstrate if there is a difference in performance. After a 12-hour fast, all participants will be given a standardized breakfast then will run for 90 minutes will a 40-pound pack, do sets of push-ups, a 40-yard dash, vertical leap and finally, run a mile. During this, weight, and urine output will be measured. Each weekend the participants will be given a different drink and who receives what will be randomized throughout the trials. To make sure all participants are fit enough to complete the protocol, they will be pre-screened with a body-fat percentage measured and endurance test.

## Development of an Evidence-Based Strength Training Program for Individuals with Dementia Participating in Adult Day Services

School of Education and Health Sciences: Physical Therapy  
Poster - Honors Thesis

**PRESENTERS** Jaclyn Helen Franz

**ADVISORS** Kurt J Jackson

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Falling and loss of mobility present serious risks for elderly adults, especially those with cognitive impairments such as dementia. These risks are shown to be significantly reduced when elderly adults participate in exercises focusing on strength and balance of sufficient intensity. Despite these potential benefits, many adult day programs do not incorporate exercise in a systematic and progressive fashion to achieve desirable improvements in function. The purpose of this project was to develop an evidence-based exercise program, later titled Simply Strong, for reducing fall risk and improving mobility in elderly adults with dementia participating in Goodwill Easter Seals adult day services. An extensive literature review of current research into the implementation and resulting outcomes of exercise for older adults with dementia was conducted. A supplementary survey of Goodwill Easter Seals program managers regarding barriers and needs was conducted. Barriers to providing such a program were identified through the survey and addressed in the creation of the program so that this program, Simply Strong, and other programs of a similar nature, have an increased likelihood of being utilized long-term. Based on the current literature, an evidence-based training program, titled Simply Strong, was developed to meet the needs of older adults with dementia and through the results of the staff survey was specifically tailored for individuals with dementia at Goodwill Easter Seals Adult Day Service. Staff members of Goodwill Easter Seals were instructed in providing the program so that the program remained self-sustaining after the conclusion of this project. Additionally, a training manual, an accompanying video, and an equipment cart to assist in the implementation of the program was fabricated and then donated to two Goodwill Easter Seals locations.

## Factors that Affect Students in an Urban Educational Setting

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Jack M Dalton, Natalie Grace Kremer, Brittany K Mason, Grace C Takacs

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation explores how factors such as grade retention, food insecurity, drug use, and the school-to-prison pipeline affect students in an urban educational setting.

## The Integration of Spirituality, Movement, and Cursive to Enhance Learning

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Emma Grace Geckle, Carolyn M Karutz, Jennifer Anne Malashevitz

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will examine spirituality, movement, and cursive writing in the classroom and its effects on the learning environment. Benefits and consequences of each classroom initiative that influences learning will be reviewed. The findings in this study could influence instruction in K-12 education.

## Parental Involvement and External Factors that Influence Academic Success

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Erin Marie Colbert, Claire N Evans, Megan Jane Stefan

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation explores how student success is affected by parental involvement, and addresses external factors such as single-parent households and cultural backgrounds.

## It's Time to Take a Second Look

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Megan McCarren, Karl L Rimelspach

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will examine the structure of the school day. Specifically, we will examine the effects of school start time on students, as well as the presence of having a lunch hour. The positives and negatives of both sides will be looked at in order to determine how to structure the best possible school day for students.

## The Effectiveness of Standardized Testing as an Analytical Tool for Various Purposes

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Gregory James Duchak, Kathleen C Gross, Logan M. Symons

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This project analyzes the relative strengths and weaknesses of standardized testing as a tool to analyze student achievement and success. The effectiveness of standardized testing in the sectors of merit pay, college admissions and intelligence levels will be discussed, as well as the effectiveness of standardized testing in general.

## Educating ELLs Beyond the Regular Classroom

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Michaela Michaela Rogan

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Currently, there are around five million ELLs in the public school system of the United States. To be successful, many English Language Learners (ELLs) may need additional opportunities for instruction outside of the regular school day. After observing at El Puente, an after-school program for ELLs, I wanted to learn more about what makes the programs effective for ELLs. I conducted a review of the research literature to determine which strategies make the after-school programs for ELLs successful. In order to effectively support ELLs after-school, the programs need to utilize the student's primary language, engage the parents/families in the process, have the instructors collaborate, allow time to practice what is taught, conduct the after-school session at a school but in an informal environment, and create unique ways of learning.

## Promoting Academic Achievement and Intrinsic Motivation in Mathematically Gifted Elementary Students

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Sarah Elizabeth Rolfsen

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Most often, the mathematically gifted student is the most neglected in an elementary classroom. Though there is very little available research on this topic, this paper will explore the available structures, programs, and strategies aimed to support mathematically gifted elementary students in both academic achievement and intrinsic motivation. Through analyzing studies involving structures such as the cluster model, distance learning, and the pull-out method, and programs such as Accelerated Math, Project M2, and Project M3, specific strategies that seem to be a common theme are identified. These strategies should be implemented in classrooms to cater to these gifted students; for they have proven positive effects on academic achievement, and often times, motivation. Though more research must be done on this topic, there seems to be a strong potential for using these structures, programs, and strategies to promote mathematical achievement among young gifted students.

## Implicit Bias

School of Education and Health Sciences: Teacher Education

Poster - Course Project

**PRESENTERS** Samantha Amanda Mack

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This poster presentation works to define implicit bias, provide strategies of dismantling these assumptions in the classroom setting, and connecting it to the experience of English Language Learners (ELLs) and ELLs with Individualized Education Programs (IEPs). There is a personal connection as I identified my own implicit bias towards disabilities, and these statistics were used to help explain the way in which we can create change for the future generation, our students. Many techniques relate to personal awareness, curriculum contexts, and the importance of understanding and identifying implicit bias in ourselves. Though becoming educated on implicit biases is the first step in creating a change in our behaviors, motivation is also a significant factor. Once motivated, the strategies incorporated into this literature review work as tools to promote an open-minded and culturally aware classroom.

## Positive Behavior Intervention and Support

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Mary Eileen Schultz

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Behavioral issues or lack of social skills can be a huge distraction to one's learning or daily life. All teachers should have a technique to not only handle but change challenging behaviors. One strategy that can be used is positive behavior intervention and support (PBIS) is an intervention used mainly with people who experience challenging behaviors. In this review of the research literature, I pursue the question what context does PBIS work most effectively in. It can be used on an individual or class wide level, offering different levels of support based on student's needs. It helps to teach self regulation and the use of appropriate behaviors. On a class wide level, it can help students with mild to severe behavior problems or those who lack social skills. PBIS tends to sustain positive outcomes over time, except in small group instruction set in a class wide intervention.

## The Importance of Technology in the Classroom for English Language Learners

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Brittany Nicole Resar

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There are various forms of technology that can benefit English Language Learners' (ELLs) success in the classroom. This literature review explores three forms of technology: interactive white boards, iPads, and computer technology and how these forms of technology can impact ELL students in the classroom. Interactive white boards can be used to provide images and videos to help ELLs learn vocabulary terms, as well as giving the entire class the same opportunity to engage with technology. When ELLs use iPads, they can work at their own pace and use a variety of features on the iPad to support their learning, such as a translator. Computer technology supplements the learning of ELLs because of a wide range of available software and computer programs. The ability to use technology to advance learning also provides motivation and new experiences for the students to keep them engaged. However, teachers must ensure that the technology is enhancing the learning of the ELL students. Some issues that teachers might face include a lack of resources, difficulty incorporating the technology into the curriculum, and language barriers when students try to understand instructions while using the technology.

## Identifying and Responding to Mental Health in Schools and the Effects on Student Achievement

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Jordan K Bailes, Allison N Karrenbauer, Meghan Mae McDonald

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

With an increasing awareness of mental health issue in students, identification of the effects on student achievement and social life are important to success. Schools are beginning to question their role in identifying and helping students reach their full potential. Furthermore, research shows that stress and test anxiety affect all aspects of schools and it is the school's responsibility to address these issues.

## Dress Code Inside and Outside of the Classroom

School of Education and Health Sciences: Teacher Education  
Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Caroline G Fahey, Jordan Lee Trenkamp

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will analyze dress code effects of academics, influence of the surrounding environment, and the argument for each position on the policy. Clothes are often a form of self-expression that help describe a person's personality and culture. This presentation will explore reasons for dress code policies and conditions people feel a dress code is unreasonable and why.

## Mentoring Strategies for the Support of High School Students Experiencing Anxiety and Depression: A Case-Study of Two Catholic High Schools

School of Education and Health Sciences: Teacher Education  
Poster - Honors Thesis



**PRESENTERS** Karin Elaine Forsthoefel

**ADVISORS** Mary Catherine Sableski

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a high prevalence of anxiety and depressive related disorders among adolescents ages 13-18 in the United States, and these statistics do not include the undiagnosed experiences of anxiety and depression that are typical during adolescence. This case study examines the supports provided for students experiencing anxiety and depression in two Catholic high schools. The aims of the study were to collect a list of strategies and interventions being used in Catholic high schools to address the needs of high school students experiencing anxiety and depression, and to investigate the use of mentoring opportunities through which teacher-student relationships can be developed. Faculty and staff members were surveyed and interviewed to gather specific information about strategies and mentoring opportunities employed. Themes among the data include the teacher roles of seeking knowledge, collaborating with parents and staff, modeling healthy coping strategies, and creating supportive environments to foster student openness.

## Support and Opposition to the Integration of Technology in the Classroom

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Nicholas Mark Bennett, Madison L Borchers, Greta E Drager, Samuel J Enderby

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

As technology continues to become more prevalent in our everyday lives, it is also growing increasingly popular in the world of education. This presentation will focus on the advantages and disadvantages of incorporating technology into classrooms, with a special emphasis on its role in student engagement.

## Exploring Issues Pertaining to Bilingual Education

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Natalie Elizabeth Blank, Taylor Lou Flight

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will discuss the tactics and overall benefits of bilingual and immersive education. In addition, cost and accessibility of these types of programs will be discussed.

## The Impact of Visual Aids for English Language Learners

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Sarah Mary Scoville

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

English Language Learners have a unique set of learning needs and learning challenges. This review of the research literature explores addressing those needs by using visual aids. The guiding research question is how do the various types of visual aids influence English Language Learners? Visual aids can come in numerous forms and be used for all ages. Visual aids help students by scaffolding and encouraging increase in self-esteem. Students perform better when using visual aids and overall benefit from them personally and academically.

## Reading and Vocabulary Strategies for Students with Learning Disabilities

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Claire Elizabeth Grabowski

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Literacy skills affect every other subject, making literacy skills crucial to success in school. Educators need to know what factors contribute to the success of reading and vocabulary strategy for students with learning disabilities. My analysis of the research literature found many effective strategies incorporate four common factors: regularly checking understanding, being easily individualized, asking clarifying questions, and providing the student with a study buddy or study group.

## Building Historical Literacies in Secondary School Students (1 of 2)

School of Education and Health Sciences: Teacher Education

Panel Discussion - Course Project, 201810 EDT 323 01

**PRESENTERS** Stephen Bucior, Lexie Marie Danch, Ben Peter Gauthier, Jalyn Gilbert, Shaylynn Aire'On Hespeth, Ciaran A Minch, Patrick Andrew Munhall, Elizabeth Ann Randall

**ADVISORS** John J White

**LOCATION, TIME** Kennedy Union Torch Lounge, 1:00-2:00

Our panel presentation will demonstrate strategies to increase historical literacy in a secondary school history classroom. We will illustrate the difference between historical knowledge and historical literacy by presenting our research on methods of teaching designed to increase historical thinking skills. Several practices that teachers should employ to teach students how to analyze historical texts using historical literacy methods will be discussed, including sourcing, close reading, corroboration, and contextualization. Having read deeply into the historiography of the Irish Famine, and after examining the famine curricula in New York and New Jersey, we will discuss how sources such as memoirs, folklore, newspaper, and government documents provide valuable insight into the heuristics that historians use when constructing a historical narrative. High school students should begin to understand and develop these heuristics after a thorough examination of the primary and secondary sources used throughout school texts and curricula facilitated by critical discussion and guidance from the teacher; we will specifically target the epistemic stance and cognitive meta-concepts used by historians.

## **Building Historical Literacies in Secondary School Students (2 of 2)**

School of Education and Health Sciences: Teacher Education

Panel Discussion - Course Project, 201810 EDT 323 01

**PRESENTERS** Macey Nicole Berkley, Kelly Michelle Conkel, Allie Lana Kenne, Marcus Anthony Lajeunesse, Laura Marie Nobel, Hannah Margaret Peterson, Dylan H Schirmer

**ADVISORS** John J White

**LOCATION, TIME** Kennedy Union Torch Lounge, 2:00-3:00

Our panel presentation will demonstrate strategies to increase historical literacy in a secondary school history classroom. We will illustrate the difference between historical knowledge and historical literacy by presenting our research on methods of teaching designed to increase historical thinking skills. Several practices that teachers should employ to teach students how to analyze historical texts using historical literacy methods will be discussed, including sourcing, close reading, corroboration, and contextualization. Having read deeply into the historiography of the Irish Famine, and after examining the famine curricula in New York and New Jersey, we will discuss how sources such as memoirs, folklore, newspaper, and government documents provide valuable insight into the heuristics that historians use when constructing a historical narrative. High school students should begin to understand and develop these heuristics after a thorough examination of the primary and secondary sources used throughout school texts and curricula facilitated by critical discussion and guidance from the teacher; we will specifically target the epistemic stance and cognitive meta-concepts used by historians.



# **SCHOOL OF ENGINEERING**

organized by department/start time

## Design of an Enhanced Cellular Model for the Assessment and Tracking of Nanomaterials

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Maggie Elizabeth Jewett

**ADVISORS** Kristen Krupa Comfort

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Due to their unique physicochemical properties nanomaterial (NM)-based technologies are growing exponentially in scope and economic importance. This surge is resulting in significant degrees of NM waste and increased rates of human exposure. This has created a vital need to fully understand the potential biological consequences of NM exposure, characterize resulting NM-biological interfaces, and determine subsequent toxicological effects. The long-term goal of this project is to design, optimize, and implement an enhanced microenvironment model (EMM) to bridge this in vitro – in vivo gap and evaluate NM characteristics, pharmacokinetic/deposition profiles, and induced biological responses under physiologically relevant conditions. To date efforts have focused on the generation of the EMM which uses a perfusion plate platform containing cellular compartments interconnected by dynamic fluid movement produced via a peristaltic pump. While the EMM system can be tailored to any target organ/tissue, this proposal is focused on the flow of NMs from lungs (A549; human alveolar epithelial) to liver (HepG2; human epithelial) to skin (HaCaT; human keratinocyte), as inhalation is a primary form of exposure and NMs have been shown to accumulate in the skin. Additionally, the human monocyte (U937) cell line will circulate through all compartments allowing for immune analysis. Once complete and optimized this EMM system will be one of the first non-microfluidic models to simultaneously incorporate physiological influences and multiple cellular compartments to improve relevance and promote in vivo-like behavior.

## The Effect of Porosity on Short Beam Shear Strength of Fiberglass Composites

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Kyle Alexander Lach

**ADVISORS** Charles E Browning, Donald A Klosterman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The presence of porosity is a well known and difficult-to-avoid defect in laminated composite materials. Excessive porosity can significantly reduce the mechanical properties of composite structures and is therefore a source of concern. In this study we investigated methods of preparing fiberglass/epoxy composite panels with the goal of being able to control the amount of porosity in the final panel, e.g. some panels with low porosity, some with high porosity. The panels were then tested for short beam shear strength, which is a property that is usually heavily influenced by interlaminar porosity. Our results indicated that, for the material system tested, the strength values were reduced only when the amount of porosity achieved a very high level. This implies that a low level of porosity can be tolerated with this material system.

## Performance Characterization of the GS-4 Gas Induction Impeller

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Shannon Marie Hoffman

**ADVISORS** Kevin J Myers, Eric E. Janz (NOV Mixing Technologies)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

High interphase contact is essential to processes involving gas-liquid reactions, and can be accomplished using gas dispersion or gas induction. In gas dispersion, gas is sparged into the vessel below the impeller, and then dispersed throughout the liquid by agitation. Gas induction is an alternative approach, which uses a hollow impeller and shaft to draw gas into the liquid phase and distribute it throughout the vessel. The GS-4 impeller is a novel gas induction impeller that is unique due to its large openings in the impeller blades and generation of an axial flow pattern. This impeller is characterized based on the power number, pressure coefficient, and modeling of the induced gas flow rate. The power number at ungassed conditions is independent of impeller size and submergence, but is higher when up-pumping than down-pumping. This parameter decreases as gas is induced, and is modeled using the relative power number as a function of the relative speed. The pressure coefficient is examined using two approaches, one using speeds below the onset of induction and the other using the critical speed. Comparison of these methods shows that the pressure coefficient is more accurately determined independently of the minimum induction speed. This information is used to relate the available pressure difference to the gas flow rate. This relationship is affected by impeller diameter, with larger impellers inducing a higher flow rate than smaller impellers for a given pressure difference. The accuracy of this model is improved by assuming that the gas flow rate is also a function of the gas-liquid contact area within the impeller.

## Study of Lithium Intercalation towards the Development of an Electrochemical Kinetic Model for Lithium/Copper Phthalocyanine Cell

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Clayton Jerrel Cashion

**ADVISORS** Sarwan S Sandhu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The development of high capacity batteries is necessary to increase the viability of renewable energy sources by providing efficient storage of excess energy. Therefore, currently the lithium ion batteries, with high charge storage capacity, are being further developed. In a lithium ion battery a reversible lithiated graphite is used rather than solid lithium as an anode. Research into high charge-storage capacity cells focuses on the cathode. Experimental investigations into high charge-storage capacity cathode active materials have indicated that copper phthalocyanine is one such material. Previous work involving copper phthalocyanine or other metal phthalocyanines has indicated that solid phase mass transport has a limiting effect on the lithium intercalation process, which is key to the operation of lithium ion batteries. Some models have been developed to describe the observed cell behavior, but the system is not yet fully understood. To ensure that the model formulation will best describe observable data, a literature search into lithium intercalation was conducted. A summary of the available understanding of this process and how we can apply this knowledge to the development of a lithium-ion battery with copper phthalocyanine as cathode active material is presented.

## Electrokinetic Desalination of Kaolin Soil with Acetic Acid

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Ronald Christopher Knapp

**ADVISORS** Robert J Wilkens, Christopher Athmer (Terran Corporation)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Sodium and chloride both dissolve in water and are carried into the ground by precipitation runoff. This runoff pollutes the soil, negatively impacting wildlife and vegetation. The use of electrokinetic remediation (EKR) techniques has been demonstrated to remove salt, heavy metals, and other contaminants from soil. One issue during the process is that chloride ions buildup near the anode, and are not removed. This experiment was performed to determine if using acetic acid as the cathode fluid during EKR would remove this buildup and increase the total amount of chloride removed. Three acrylic tubes were packed with kaolin clay with an initial concentration of 800ppm NaCl. Each tube used tap water as the anode purge solution. The cathode purge solution was initially tap water; after two days, the purge solution for Tubes 2 and 3 were switched to 0.1M acetic acid and 0.5M acetic acid, respectively. The electrodes were flushed at a rate of 50.00?L/min. The tubes were hooked up to a DC power source providing 15V for 11.5 days. Ion selective electrodes, a spear-tipped pH probe, and a handheld multi-meter were used to collect data. 55.8% of the chloride ions were removed from Tube 1, 56.7% from Tube 2, and 53.1% from Tube 3. Tube 3 also had the greatest concentration of chloride ions remaining near the anode at 9220ppm. As the concentration of acetic acid increased, the amount of chloride remaining near the anode increased. The use of acetic acid did not affect the overall removal of chloride ions.

## Thermal Engineering for Flexible, High-Power Electronics

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Katherine Morris Burzynski

**ADDITIONAL AUTHORS** E. W. Blanton, N. R. Glavin, E. R. Heller, M. Snure, E. Heckman (WPAFB Research Laboratory); C. Muratore (University of Dayton)

**ADVISORS** Christopher Muratore

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Consumers and military personnel are demanding faster data speeds only available through fifth generation (5G) wireless communication technology. Furthermore, as wearable sensors and other devices become more ubiquitous, devices demonstrating enhanced flexibility and conformality are necessary. The challenge is to enable electronic devices to withstand strain and continue to operate within an acceptable tolerance to ensure reliability. A fundamental challenge for flexible electronics is thermal management. Even on rigid substrates with 100 times higher thermal conductivity than polymeric and other flexible substrates, the full potential of semiconducting materials is often thermally limited. The flexible gallium nitride (GaN) high electron mobility transistors (HEMTs) employed in this work are grown on a two-dimensional boron nitride (BN) release layer that allows the conventionally processed devices on sapphire wafers to be transferred using a polymeric stamp and placed onto a variety of rigid and flexible substrates. Characterization of the GaN device behavior on the as-grown sapphire wafers (not transferred) provide a baseline for evaluation of the thermal performance. Transferring the GaN devices to flexible substrates enables application of strain during device operation; however, device performance typically suffers due to the low thermal conductivity of most polymeric substrates, requiring more advanced schemes to remove waste heat from device operation. In situ thermal imaging of devices in operation reveals that the current passing through a non-transferred GaN transistor on a sapphire wafer reaches the target operating temperature at twice the current of the same device transferred to a flexible substrate. Packaging environment simulations and consideration of device-substrate interfacial thermal effects allow for an understanding of how the flexible GaN devices operate after they are transferred to a substrate and show the path forward for substrate design to reduce thermal limitation of high-power flexible electronics.

## Effect of Stabilizing Agent Concentration on the Development of Renewable-Magnetic Nanocomposites

School of Engineering: Chemical Engineering

Oral Presentation - Graduate Research

**PRESENTERS** Frankie Ann Petrie

**ADVISORS** Erick Vasquez

**LOCATION, TIME** Kennedy Union 331, 10:30-10:50

Magnetic nanoparticles are attractive materials due to their ease of manipulation under the presence of a magnetic field and their inherent superparamagnetic properties. In order to produce a stable colloidal solution of magnetic nanoparticles, several encapsulation mechanisms or stabilizing agents have been proposed. In this work, iron oxide-lignin nanoparticles were synthesized using a co-precipitation method and a self-assembly mechanism in alcohol/water mixtures using Kraft lignin in twenty percent ammonium hydroxide solutions. The effects of five different ratios of iron to lignin solution were analyzed in the syntheses process, four changing the amount of lignin used, one changing the concentration of iron used. The particles were characterized by DLS, TEM, UV-Vis, FTIR, and zeta potential analyses. The hybrid nanoparticles showed an average diameter around 200 nm. TEM images of the particles displayed encapsulation of iron oxide within the lignin. The results of this research show that superparamagnetic iron oxide nanoparticles coated with lignin were successfully synthesized. The outstanding properties of lignin as a renewable material, which could be used as antioxidant, UV adsorbent, antimicrobial agent, or biomaterials conjugate, make the lignin-magnetic nanocomposite a unique substrate for a plethora of future investigations.

## Electrochemical Quartz Crystal Microbalance Studies of Lignin in Aqueous Solutions

School of Engineering: Chemical Engineering

Oral Presentation - Independent Research

**PRESENTERS** Grace Ann Docken, John Flynn

**ADVISORS** Erick Vasquez

**LOCATION, TIME** Marianist Hall Learning Space 218, 12:30-12:50

An Electrochemical Quartz Crystal Microbalance (EQCM) uses an electric potential to induce oxidizing or reducing conditions for electrochemical synthesis and analysis. One application of EQCM applies a series of voltages to a sample and measures the corresponding current generated in the solution being analyzed. This application, known as Cyclic Voltammetry (CV), provides insight into properties such as molecular mass, impedance, and film thickness. Both EQCM and CV have been used in the characterization of polymers and various biomaterials. In this study, lignin—a naturally occurring polymer—was deposited on gold-coated substrates in a buffer solution. The corresponding lignin thin-film was characterized at various concentrations in the presence of a reducing agent, thus altering the pH of the buffer solution. The effect of ascorbic acid and polyvinylpyrrolidone (PVP) as reducing agents on the assembly of lignin to gold substrates was measured using EQCM and CV. With this study, we can determine the redox properties of lignin in various aqueous solutions of differing pH. These results provide insight into the conditions required for lignin self-assembly under a pH-controlled environment.

## Characterization of Zinc-Histidine Interactions in Nvjp-1

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Brittanie M Rooths

**ADVISORS** Rajiv Berry, Kristen Krupa Comfort

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The mandible of *Nereis virens*, a marine sandworm, is mostly organic with stiffness and hardness comparable to that of human dentin. Nvjp-1 is the primary protein in the *Nereis* jaw and is inherently Histidine rich. Histidine contributes to the stability of the protein structure and superior mechanical properties through metal-coordinate bonds. Crosslinking of purified recombinant Nvjp-1 creates a water stable hydrogel that is capable of expanding and contracting upon exposure to various ions. Nvjp-1 hydrogels exhibit sclerotization through metal-coordination with divalent cations. Over ninety percent of the amino acid sequence of the carboxy-terminal of Nvjp-1 is comprised of only four amino acids. In order to determine the genetic/protein motifs directly responsible for the mechanical response, a carboxy-terminal truncation mutant of Nvjp-1 was recombinantly expressed and crosslinked to form hydrogels. Dynamic mechanical analysis was performed on the carboxy-terminal truncation mutant to compare its mechanical properties to that of the full-length protein. De Novo structure prediction was performed using Molecular Dynamics simulations as a technique for determining native protein structures. The role of Zn-Histidine interactions in Nvjp-1 and their effect on protein structure was also investigated.

## Initial Study of Novel Flame Retardants For Epoxy Resin Systems

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Abdulhamid Ali Bin Sulayman

**ADVISORS** Vladimir A Benin, Donald A Klosterman, Alexander B Morgan

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This poster describes the initial investigation of the reaction between a novel flame retardant (FR) and epoxy resin. The novel chemical (synthesized and provided by UD Chemistry Department faculty) is a phosphorus-based flame retardant that also

incorporates primary and/or secondary amine functional groups. These groups potentially could react with epoxy resins, which would then incorporate this FR chemical directly into the polymer network through covalent bonding. This would be a way of introducing flame retardants into epoxy resins to improve flammability of composites. Initial research was conducted using Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), and Fourier Transform Infrared Spectroscopy (FTIR). The results indicate that the flame retardant is indeed reacting with the epoxy resin to form a crosslinked network. Future work will involve characterization of the cured epoxy-FR network for physical properties, mechanical properties, and flammability.

### Applications of Gas Chromatography with Headspace Autosampler

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Paul Robert Maricocchi

**ADVISORS** Yvonne Y Sun, Erick Vasquez

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The identification and quantification of chemical compounds in a mixture aids in the analysis of a broad range of processes ranging from chemical separation processes to biological separations. In an effort to enhance interdisciplinary collaboration across Units and Departments within the University of Dayton, we seek to understand and develop Gas Chromatography (GC) and Headspace-GC (HS-GC) analytical methods for use both in the classroom and research. The overall goal of this research is to present a summary and explanation of the variables that are manipulated in a GC equipment for the development of characterization methods. Calibration curves will be used to quantify compounds from different samples. Specifically, the methods and calibrations will focus on: (1) analyzing ethanol content in aqueous and organic mixtures, which ultimately can be applied to chemical engineering unit operations such as distillation and fermentation; (2) characterizing the efficiency of liquid-liquid extraction processes, which will be characterized using HS-GC; and (3) a biological application towards characterizing SCFA (short chain fatty acids) content in *Listeria* metabolites present in mice feces. This is an interdisciplinary project scheduled for this coming summer with Dr. Sun of the Biology Department, along with Dr. Vasquez of the Chemical Engineering Department. Ultimately, this research will culminate in an Honors Thesis that will help to obtain various GC methods for a variety of processes.

### Combinatorial Effects of Silver Nanoparticles and Hypoxia on Lung Cells

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Cameron Mark-Allan Crasto

**ADVISORS** Kristen Krupa Comfort

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Silver nanoparticles are used in a variety of both consumer and medical applications. They possess antimicrobial properties that can stress mammalian cells through the formation of reactive oxygen species (ROS). This experiment looked at A549 human lung alveolar cells with exposure to 10nm silver citrate nanoparticles (AgNPs) in both a normal oxygen environment and hypoxic environment. Cell viability, formation of ROS, as well as the phosphorylation of both HSP27 and NF $\kappa$ B. In both environments, concentrations of 5 $\mu$ g/ml saw significant reduction in cell viability. There was a slight loss in cell viability in the hypoxic environment. The hypoxic environment saw significant increases in ROS at concentrations as low as 0.1 $\mu$ g/ml. In addition, when exposed to 5 $\mu$ g/ml of AgNPs, it was shown to increase phosphorylation of the HSP27, but reduce the phosphorylation of NF $\kappa$ B proteins, which play a crucial role in the stress level of a cell. (We are going to execute another experiment this week, which would combine exposure to AgNPs and low O $_2$  - 10% CO $_2$  on the A549 cell line. Once we get this data, we will update the abstract and be ready for the presentation.)

### Using and Implementing Continuous Stirred-Tank Reactors and Plug Flow Reactors to Study Reactions in Undergraduate Chemical Engineering

School of Engineering: Chemical Engineering

Poster - Course Project, 201810 CME 499 01

**PRESENTERS** Alex Robert Paschal

**ADVISORS** Michael J Elsass, Erick Vasquez

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Understanding the behavior of Continuous Stirred-Tank Reactors (CSTR) and Plug Flow Reactors (PFR) is vital to graduates of the University of Dayton's Chemical Engineering Program. This primarily is due to the widespread usage of these reactor types in commercial settings; therefore, students should be exposed to 'hands-on' laboratory experiences with these type of reactors prior joining the Chemical Engineering workforce. Realizing that the Unit Operations Laboratory is a capstone class, and it lacked adequate education on such reactors, experiments were developed and performed on both types of reactors to establish empirical standards of reaction kinetics and rates that can be used to guide the education of future undergraduate chemical engineering students. Overall, the CSTR and PFR reactors were used to develop theoretical and empirical understandings of the reactor systems based on calibration of reactor system mechanics; non-reactive qualitative experiments; and bimolecular-reactive experiments. Specifically, the saponification reaction between Sodium Hydroxide and Ethyl Acetate producing Sodium Acetate and Ethyl Alcohol was the primary reaction analyzed in this work. As a quantitative result, models of the studied reaction in both types of reactors were developed and compared. In addition to this common experiment, reactions for future studies to be tested by undergraduate

students using green solvents and reactants are suggested. Ultimately, this work will lay the foundation of chemical reactor analysis in the Unit Operations Laboratory at the University of Dayton.

### **Understanding the effects of double activated carbon, desorption temperature and time, and possible ethanol decomposition during desorption on Solar Thermal Adsorption Refrigeration (STAR) system**

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Bipin Karki

**ADVISORS** Jun-Ki Choi, Amy R Ciric

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The off-grid location and unreliable electricity supply to medical clinics in remote parts of India make it difficult to safely store vaccines and other medications using traditional refrigeration systems. The Engineers in Technical Humanitarian Opportunities of Service-learning (ETHOS) program at the University of Dayton, in collaboration with Solar Alternative and Associated Programmes (SAAP) of Patna India, are developing a novel refrigeration system which works on the principle of solar thermal adsorption. This refrigeration system does not require electricity for operation and uses safe, environmentally benign and locally available adsorption pair of ethanol-activated carbon. A bench-scale prototype was developed at the University of Dayton using ethanol-activated carbon as working pair which can generate evaporative temperatures between 20C and 80C. The existing horizontally oriented system can achieve targeted refrigeration temperatures (2-80C) during the adsorption cycle and ethanol can be desorbed from the activated carbon during desorption. However, the horizontal geometry inhibited the return of liquid ethanol to the evaporation chamber. A new vertical oriented bench scale system was built to address the limitation of the original prototype. The effects of double activated carbon on evaporative cooling, heating temperature and time during desorption, and possible decomposition of ethanol during desorption was analyzed. The evaporator temperature -12.70C achieved during the experiments indicates better adsorptive cooling with double activation technique of activated carbon. Experimental results suggested better desorption happens at elevated temperature (105 - 1150C) and most of the desorption happens in the first 2 hours of heating the activated carbon chamber. The pressure drops on ethanol side pressure gauge reading during desorption and analysis of mass spectroscopy of desorbed ethanol obtained from the chemist showed possible decomposition of ethanol preventing multiple cycle operation of the system.

### **Real-time camera tracking and 3D scene reconstruction based on pose graph**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ruixu Liu

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The 3D reconstructed maps can be used in many applications such as robot navigation, augmented reality and virtual reality. 3D maps for the environment has been developed using RGB-D sensor data that provides color and depth information. RGB-D camera noise, fast camera movement, and rotation introduce drift in the reconstructed 3D maps. If the scale of the 3D model increases, the drift error is also accumulated which can affect the final 3D model performance. A good way to reduce the drift is loop closure detection which is based on visual place recognition. It is an extremely challenging problem to solve in the general sense. First, a place recognition system must have an internal representation of a map of the environment to compare to the incoming visual data. Second, the place recognition system must report a brief about whether or not the current visual information is a place already included in the map, and if so, which one. If the loop closure detects successful, we could use the loop closure pose to correct current camera pose to enhance the camera tracking accuracy and 3D model performance.

### **Development of the Numerical Attenuation Factor for a Spiral Antenna affected by Spurious Modes**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Joseph Vinci

**ADVISORS** Robert P Penno

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This poster details the work performed in the 2017 SURE Program under Dr. Robert Penno. The objective is to improve Dr. Penno's model for the four arm, Archimedian spiral antenna in the presence of spurious modes by developing an attenuation constant. This constant is derived from the principles of a transmission line with shunt loads in the place of the arms of the antenna with spurious modes. The results are prepared to be analysed by Dr. Penno and the effectiveness of the constants on the radiation pattern of the antenna will be examined in future work.

### **An Efficient Leaf Recognition Based Approach for Plant Classification Using Machine Vision Strategy**



### School of Engineering: Electrical and Computer Engineering

Poster - Course Project, 201780 ECE 695 04

**PRESENTERS** Redha Ali, Russell C Hardie

**ADVISORS** Russell C Hardie

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The identification of plants is very important component of workflows in plant ecological research. Therefore, in this work, we are developing a novel automatic leaf recognition for plant classification. Unlike the existing techniques, our approach is efficient, fast, and simple. The proposed method is based on machine vision strategy that employs two main processing stages: 1) the Bag of Feature (BoF) approach, and 2) a decision-making model based on multiclass Support Vector Machine (SVM) classifier. The BoF is utilized for extracting the features from representative images. First, to provides excellent scale invariance break up the image into sub-regions by using speeded up robust features (SURF) detector. Then, compute the histogram of local detected features inside each sub-region. After that to create the visual words and to reduce the number of features, the K-means clustering approach is applied. The final sets of features are fed to a decision-making model based SVM classifier for automatic plant identification. Experimental results on several publicly available leaf datasets demonstrate that the effectiveness of the proposed method for plant classification compared to a set of state-of-the-art methods.

### Authentication Of the Internet of Things Devices Over ZigBee Networks

School of Engineering: Electrical and Computer Engineering

Poster - Independent Research

**PRESENTERS** James Patrick Althoff

**ADVISORS** Feng Ye

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

IOT, or the Internet of Things, is the inter-networking smart devices, buildings and other embedded systems to enable them to transfer data between them. This data can be used for various uses such as power management and home automation. Current projections of the Internet of Things predicate that the use of this technology will increase dramatically within the foreseeable future. Many of these devices are currently being implemented using protocol such as Bluetooth and ZigBee. ZigBee is a wireless communication protocol based on the IEEE 802.11.4 standard. ZigBee was created for low power devices, such as those that run on batteries, with the industrial settings being among the common implementation of ZigBee enabled devices. The project focuses on improving the ZigBee protocol, specifically in the authentication section of the protocol.

### Multi-Feature Fusion Approach for Object Classification on Oil/Gas Pipeline Right-of-Ways

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ming Gong

**ADVISORS** Vijayan K Asari, Almabrok Essa

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Pipeline right of way (ROW) monitoring and safety pre-warning is a vital way to guarantee safe operation of the oil/gas transportation. Any construction equipment or heavy vehicle intrusion is a potential safety hazard to the pipeline infrastructure. Therefore, we propose a novel technique that can detect and classify any intrusion on oil/gas pipeline ROW. The detection part has been done based on our previous work, where we built a robust feature set to represent an object from two parts. Firstly, we divide an image into two circular regions with linearly increasing areas and pyramid levels. Then the histogram of the local feature is extracted for each sub-region and in multiple pyramid levels. After that a support vector machine with radial basis kernel is used to detect objects. For the classification part, the object can be represented by a robust fusion feature set, which is a combination of three different feature extraction techniques, histogram of oriented gradient (HOG), local binary pattern (LBP), and the color histogram of HSV (hue, saturation, value). Then a decision making model based support vector machine classifier is utilized for automatic object identification. It is observed that the proposed method provides promising results in identifying the objects that are present on the oil/gas pipeline ROW.

### Aircraft Generator Design and Analysis

School of Engineering: Electrical and Computer Engineering

Poster - Honors Thesis

**PRESENTERS** David Gross

**ADVISORS** Kevin Yost (WPAFB Research Laboratory), Guru Subramanyam

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Aircraft electrical power demands have been rapidly growing due to an increased amount of electrical load onboard aircraft. This increased load has come about as electrical sources for various aircraft subsystems, such as pumps, compressors and flight controls, replace mechanical sources. The main source of electrical power on an aircraft is a generator. The power demand on an aircraft is not constant, but rather dynamic, and the nature of these power demands causes increased temperatures and complex/dynamic loads, for which many contemporary generators are not designed. Because of the need for high amounts of reliable electrical power

among future aircraft, future generators should be designed for reliability, stability, power density and long-term durability. The objective of this thesis project is to determine if generator sizing techniques (e.g. equations, assumptions, rule-of-thumb metrics) can be calculated to a reasonable accuracy for preliminary machine design optimization and analysis.

## **A Survey of Tundra Lake Size Changes During Around 40-year Time Interval Observed in Historical Maps and Satellite Images**

School of Engineering: Electrical and Computer Engineering  
Poster - Graduate Research

**PRESENTERS** Ming Gong

**ADVISORS** Vijayan K Asari, Almabrok Essa, Ivan A Sudakov

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Greenhouse gas emissions from tundra lakes are a significant positive feedback to the atmosphere in a changing climate as a pronounced growth of the numbers of tundra lake patterns has been observed in the Arctic region. Detailed knowledge of changes in tundra lakes size is potentially valuable in order to understand and accurately model the sources of greenhouse gas emissions. Therefore, we are using historical maps and satellite images with time interval around 40-year to show a study of tundra lake size changes. We have developed a novel algorithm framework that is employing three main processing stages: lake detection, lake segmentation, and lake size computation. In the first stage of the framework, there are two different approaches, one is for detecting the lakes on historical maps that is a color-based segmentation technique, and another one is for detecting the lakes from satellite images which is a decision-making model based on support vector machine classifier (SVM). The second stage of the algorithm is a region growing approach that is applied for the detected lakes from both historical maps and satellite images, to segment the actual lake size. The last stage is calculation the lake size which is applied for the final segmented lakes from both historical maps and satellite images. It is based on connected component analysis strategy, which calculates the lake size in terms of number of pixels. Experiments performed on changes in lake size over time in a set of lakes that were visually matched in both the historical map and the satellite imagery demonstrate that some lakes in our study region have increased in size over time, whereas others have decreased in size over time. Lake size change during this time interval can be up to half the size of the lake as recorded in the historical map.

## **Optimization of Wireless Electroceutical Dressings in Wound Healing for Burn Victims**

School of Engineering: Electrical and Computer Engineering  
Poster - Independent Research

**PRESENTERS** Nilan Mani

**ADVISORS** Amy T Neidhard-Doll

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The purpose of the proposed interdisciplinary research is to investigate how the electrochemistry of Wireless Electroceutical Dressings (WEDs) can be optimized to fight infection and promote healing in the wounds of burn victims. One of the most common secondary complications is infection, since bacteria and microbes are able to enter the human body freely in the absence of a protective layer of skin. Infection has been determined to be the leading cause of death in approximately 61% of all reported burn victim cases. Once inside the body, bacteria readily form biofilms to shield themselves from antibiotics and increase resistance to treatment by humans. As a result, an anti-biofilm treatment method is necessary to eliminate the biofilm barrier that currently exists when treating disease. A proof of concept for the nanofabrication of an alternative, Biomimetic Wireless Electroceutical Dressing (BWED) that increases bacteria-disruptive microcurrents through optimization of electrode design (material, geometry, volume, and/or circuitry) will be discussed. This feasibility study entails monitoring the growth of various bacterial colonies cultured from common locations in the environment (e.g. cell phone, door knob, elevator buttons) in the presence of various BWED configurations. The research will attempt to show whether BWEDs work better at decreasing the growth of bacteria colonies when compared to a control group with no BWED present. This information will be used to determine the most promising electrode designs to optimize and fabricate in the future.

## **Study of Electrolyte/Electrodes Interface Engineering in Solid State Lithium-Ion Batteries**

School of Engineering: Electrical and Computer Engineering  
Poster - Graduate Research

**PRESENTERS** Ashish Gogia

**ADDITIONAL AUTHORS** Priyanka Bhattacharya, Badri Shyam

**ADVISORS** Jitendra Kumar, Guru Subramanyam

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a growing need for high energy, high power and safe lithium batteries for myriads of applications in powering microelectronic devices (such as smart cards, implantable medical devices, wearable electronics) to large power applications such as electric vehicles, aerospace and space equipments. One key requirement for such batteries is packing high energy in low form factor (i.e. thin-film form) to increase both the gravimetric and volumetric energy densities. Lithium superionic conducting solid ceramic electrolytes are the most prominent candidates amongst liquid, gel, polymer and solid ceramic electrolytes that can enable safety and optimum performance in a high energy density battery with thin-film cell components. For example, lithium aluminum germanium

phosphate (LAGP) has been proven to be a promising solid-electrolyte due to its high ionic conductivity ( $\sim 5$  mS/cm at 23 °C), high electrochemical stability window ( $> 5$ V), and single Li<sup>+</sup> ion conduction (high transference number, no dendrite formation, no crossover of electrode materials), thus enabling high energy battery chemistries and mitigating safety and packaging issues of conventional lithium batteries. However, application of solid-electrolyte (LAGP and others) in Li batteries is being hindered by lack of understanding of thin-film fabrication techniques/parameters, mechanical stability, and poor stability between solid ceramic electrolyte and electrodes, especially with Li metal anode. Low chemical stability between solid electrolyte and Li electrodes forms resistive interface (lower conductivity) which is detrimental for high power and cell longevity. We present materials and methods for electrolyte/electrode interface engineering that have shown promise but need further investigation. One such promising stable interface material is lithium phosphorus oxynitride (LiPON), when introduced as thin-film in between LAGP and Li reduces interface resistance (increase conductivity) considerably. Details on material's thin-film fabrication techniques such as sputtering, physical vapor depositions, etc. and their resultant effects on solid-state battery performance will be presented.

### On-chip memristor training with detailed op-amp circuit

School of Engineering: Electrical and Computer Engineering

Oral Presentation - Graduate Research

**PRESENTERS** Baminahennadige Rasitha Fernando

**ADVISORS** Tarek M Taha

**LOCATION, TIME** Kennedy Union 310, 11:00-11:20

Neural networks have gained and renewed widespread attention in recent years due to large volumes of data generation in almost all fields. This led to development of Deep Neural Networks (DNNs), which have demonstrated significantly better classification on image recognition and other datasets than previous techniques. DNN algorithms have two phases: training and inference that typically run on graphics processing units (GPUs). The training phase is much more computationally challenging, therefore it is difficult to implement it on low power systems. There is an urgent need for new systems that can provide real-time data processing with high power efficiency. Implementing learning on low power systems can open-up a broad new set of applications – particularly in making systems more smart and secure. Nanoscale analog devices called memristors can be used for this specific purpose, which can execute computations in parallel and consume small area and low power. These characteristics in the computing system allows implementation of the training of DNNs, consuming about  $\times 10000$  times less energy than a GPU. In literature, fix gain op-amp circuits are suggested in memristor crossbar-based learning. Due to frequent change in the resistance values of the crossbar at weight update (will affect the op-amp gain function) causes the neural network training to fail in a circuit level implementation. A detailed op-amp circuit has been proposed to improve memristor neural training. Two and four odd parity tests at different discretized pulse width provided significant results. This detailed circuit and device analysis of the op-amp implementation may serve as a foundation for further circuit-level studies.

### Human detection on omnidirectional camera imagery by multi-feature fusion based on gradients, color and local phase information

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Hussin Khalifa A Ragb

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Field of view of the traditional camera is limited such that usually more than three cameras are needed to cover the entire surveillance area. The use of multiple cameras usually require more efforts regarding camera control and set up as well as they need additional algorithms to find the relationships among the images of different cameras. In this research work, we present a multi-feature algorithm that employs only one omnidirectional camera instead of using multiple cameras to cover the entire surveillance region. Here we use the image gradients, the local phase information based on phase congruency, the phase congruency magnitude, and the color features. These features are fused together to build one descriptor named as “Fused Phase, Gradients and Color features (FPGC). The image gradients, and local phase information based on phase congruency concept are used to extract the human body shape features. Either LUV or grayscale channel features are used according to the kind of camera used. The phase congruency magnitude and orientation of each pixel in the input image is computed with respect to its neighborhood. The resultant images are divided into local regions and the histogram of oriented phase, and the histogram of oriented gradients are determined for each local region and combined. A large pool of the candidate features is randomly generated for one channel of the phase congruency magnitude and three LUV color channels. All these features are fed to a decision tree Adaboost classifier for training and classification between the classes. The proposed approach is evaluated on a challenging omnidirectional dataset and observed promising performance.

### A Low Power High Throughput Architecture for Deep Network Training

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Yangjie Qi

**ADVISORS** Tarek M Taha

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

General purpose computing systems are used for a large variety of applications. Extensive supports for flexibility in these systems limit their energy efficiencies. Neural networks, including deep networks, are widely used for signal processing and pattern recognition applications. This poster presents a digital multicore on-chip learning architecture for deep neural networks. It has memories internal to each neural core to store synaptic weights. A variety of deep learning applications can be processed in this architecture. The system level area and power benefits of the specialized architecture are compared with an NVIDIA GEFORCE GTX 980Ti GPGPU. Our experimental evaluations show that the proposed architecture can provide significant area and energy efficiencies over GPGPUs for both training and inference.

## **Model Predictive Control Energy Dispatch to Optimize Renewable Penetration for a Microgrid with Battery and Thermal Storage**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ibrahim Aldaouab

**ADVISORS** Malcolm W Daniels

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

As intermittent renewable energy becomes a larger fraction of the overall energy mix in the US, algorithms that efficiently utilize this energy are necessary. In this work, a model predictive control (MPC) method is developed to perform real-time optimization to maximize the power delivery from a renewable supply to a building. An isolated microgrid scenario is considered, consisting of a mixed-use residential and commercial building, renewable power supply, battery storage, hot water tank thermal storage, and a backup supply. The MPC strategy utilizes predictions of the building's electrical and hot water loads, on an hourly basis, along with predictions of the output from the renewable supply. At each time step, these predictions are used to create an optimized power dispatching strategy between the microgrid elements, to maximize renewable energy use. For a fixed size microgrid, the performance of this MPC approach is compared to the performance of a simple non-predictive dispatching strategy.

## **Brain Machine Interface Software Application for Data Collection, Thought Analysis, and Robotic Arm Control**

School of Engineering: Electrical and Computer Engineering

Poster - Capstone Project

**PRESENTERS** Jason Demeter, Alexander Robert Jereb, Clayton T Kern, Brad Richard Sorg, Jamie Stanton

**ADVISORS** Vijayan K Asari, Garrett Craig Sargent

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The overall purpose of the ongoing Brain Machine Interface (BMI) project is to develop an electroencephalography (EEG) interface and a robotics control application which will further enable people with disabilities to achieve autonomy. The project consists of developing, building, and testing an end-to-end system to translate raw EEG data into actionable information. This can be used to control a robotic arm and for other research purposes. A BMI is a system that collects the brain's electromagnetic signals by utilizing sensors, extracts meaningful signals from the data, classifies thoughts, and ultimately uses thoughts as an input to a computer system. The computer system then has the ability to control hardware and software, which for this project is a robotic arm. The team improved the robotic arm user interface, developed a graphical user interface (GUI) for thought recognition, and explored future research paths by partnering with local experts. To improve the usability of the robotic arm user interface, the team developed software that allows easier performance of useful activities, such as using a pen to play tic-tac-toe, playing piano, and picking up objects. The Insight headset by Emotiv was used by the team for data collection. The headset can stream real time EEG data and control signals, however the Emotiv software solution for data collection is closed and proprietary. To use the Vision Lab's noise reduction and muscle signal removal algorithms, the team created a GUI to train the thought classification system and collect and process the data. EEG phoneme detection is a future research path that allows for thought to speech translation. The team investigated EEG phoneme detection by implementing algorithms which can identify phoneme sounds from audio recordings. Using these working algorithms, further research will implement phoneme detection using only EEG signals with no audio.

## **The Application of Neurologically-Controlled Robotics to Actuated Feeding Arms**

School of Engineering: Electrical and Computer Engineering

Poster - Honors Thesis

**PRESENTERS** Timothy Edward Dombrowski

**ADVISORS** Raul E Ordonez, Temesguen Messay Kebede

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The medical industry is constantly performing research and trying to combat various diseases that afflict humans. Despite advancements in technology, there still remain diseases that have no cure but seem prime candidates for neurologically controlled robots. One such category of diseases consists of various muscular dystrophic diseases. Diseases such as ALS and Parkinson's have limited options regarding treatment, but by brain controlled interfaces (BCI's), robotics can help mitigate the impact on a patient's quality of life. By utilizing a functioning mind, an electroencephalographic (EEG) helmet can be used to control various exoskeletal systems

and even prosthesis in order to compensate for a damaged motor system. Through the use of neurologically controlled robotics, a user's motor control and motor strength can be rehabilitated and maintained despite the effects of muscular dystrophic diseases. The goal of this project is to use this experiment to demonstrate the current effectiveness of brain actuated robotics and telepresence that utilize an EEG Sensor. From this assessment, recommendations and further improvements can be made to this existing technology for it to be better suited for electrical engineering and biomedical applications, while simultaneously taking the technology into a new realm of application.

### **Variable Stiffness Series Elastic Actuator for Collaborative Robots**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Manoj Kumar Sharma

**ADVISORS** Raul E Ordonez

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Robotic manipulators with joints that are capable of precisely monitoring the instantaneous torque are currently being used in collaborative robots. These robots are safe to work alongside human beings, and execute tasks that rely on force control. A spring is placed in series inside a robotic joint actuator deflects as per the torque transfer; this information is then used by the controller to control the robot as needed. Based on this key idea, a new device is invented wherein the spring stiffness can be servo-controlled. An intelligent controls scheme is developed that helps to create a safe collaborative workspace.

### **Convolutional Neural Network Based Multi-view Object Classification**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Zhiyuan Xie

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In recent years, neural networks have become more and more popular because of their outstanding performance in the object classification area. The convolutional neural network (CNN) is a deep learning, feed-forward neural network that has excellent performance in visual imagery analysis area. The idea of the connectivity pattern between neurons of the CNN came from the organization of the animal visual cortex. For human vision, different observational directions of objects can get different views. Human can easily recognize objects in different observational directions, but machines cannot achieve this easily. Therefore, multi-view object classification has been researched for many years. To solve this problem, we design an efficient CNN architecture to perform classification of the multi-view images of objects by appropriately choosing the number of layers, the sequence of layers cascading, and size of the filters. Then, we improve the classification performance by adding image enhancement techniques before CNN as a preprocessing stage. CNN extracts various significant features of the image. It is expected that an enhanced image helps to extract stronger features. The training and testing input images of the CNN are original images or enhanced images. The image enhancement is performed by nonlinear enhancement techniques such as multilevel windowed inverse sigmoid (MWIS) function based technique or a locally tuned sine nonlinearity (LTSN) technique. It is observed that the preprocessing by image enhancement provides improved performance in the cases of the smaller training set. Research work is in progress to modify the CNN architecture to see the impact of recognition performance for multi-view object classification. Advanced non-linear enhancement technologies might also be investigated to see the effectiveness in classification.

### **Mobile Sensor Lab**

School of Engineering: Electrical and Computer Engineering

Poster - Independent Research

**PRESENTERS** Brandon Mckenzie Hampshire

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Vision Lab has many projects that involves data collection from various sensors. These sensors can vary by platform and programming language. In order to centralize data collection, the Robot Operating System (ROS) is applied to the Clearpath Husky robot. The Husky is made for multi-terrain transport and can be modified to carry multiple sensors. The Robot Operating System is not an operating system but is a network centralized library. ROS provides background services and different language libraries that allow sensors and languages to communicate to a common location. In addition, the libraries can let the user to receive data from the central network thus allowing multiple cross language platform communication. An application of these components can assist in data collection for environment 3D reconstruction. Environment 3D reconstruction requires depth imagery, RGB imagery, and orientation of the camera. The Husky provides estimated orientation to ROS and ROS supports the Microsoft Kinect. With open source coding, the Husky can be coded to collect the necessary data for 3D reconstruction.

### **Deep Neural Network Based on FPGA**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Shuo Zhang

**ADVISORS** Tarek M Taha

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

With the rapid proliferation of computing systems and the internet, the amount of data generated has been increasing exponentially. This includes data from mobile devices, where almost all information is now becoming computerized, and science experiments, where large simulations on supercomputers are increasingly becoming the norm. With this massive increase in data, a key issue is how we process and make sense of this data. This is called the "Big Data" challenge. Deep learning is a class of mathematical algorithms that is now heavily used for Big Data analytics. These algorithms are based on very large scale neural networks. One of the key challenges with deep learning is that it requires massive computing power. At present clusters of high performance graphics cards designed primarily for computing (known as GPGPUs) are used for these tasks. A key problem with clusters of GPGPUs, is that they consume large amounts of energy, thus making it difficult to scale existing massive computing systems to future Big Data volumes. The deep neural network designed by Parallel Cognitive Systems Laboratory is based on application specific integrated circuits (ASIC), which provides high performance at reasonably low power consumption. However, these are extremely expensive to fabricate. The Field Programmable Gate Array (FPGA) is a type of integrated circuit that can be reconfigured to implement a large range of arbitrary functions according to application requirements. FPGAs are much cheaper than ASIC and consume less power than CPU and GPU. The objective of this proposal is to develop deep learning network based on FPGA. I will optimize the whole design to make it more suitable for the deep learning. Several pattern recognition applications which use deep learning will be used to test and evaluate the design.

### **Building a high temperature 4-point probe to study GST phase transition material**

School of Engineering: Electro-Optics and Photonics

Oral Presentation - Graduate Research

**PRESENTERS** Pengfei Guo

**ADVISORS** Imad Agha, Andrew M Sarangan

**LOCATION, TIME** Fitz Hall 580, 1:20-1:40

Phase change materials (PCM) use the reversible phase change between crystalline and amorphous phases by Joule heating via electrical or optical sources. The chalcogenide material GST is the focus of this work. This material has different optical and electrical properties in amorphous and crystalline phases, allowing it to be used in optical and electrical switching devices. Such as reconfigurable phase retarders and polarizers. We are going to build a high temperature probe to study the resistivity of the deposited GST films. The electrical properties of thin films are determined by their chemical composition, the content and type of impurities in the thin film or on its surface, crystal structure of the thin film and the types and density of structural defects. The measurement of thin film sheet resistivity via two point probe method which inadvertently introduces errors due to probe resistance, spreading resistance and contact resistance between probing tips and the samples. On the other hand, the commercial probing devices are expensive while the principle of mechanics is simple. Due to the above limitations. This high temperature probe can give us the ability to study the resistivity of GST thin film in-situ.

### **Directional Emission of Light in Hyperbolic Metamaterials through Spin-Orbit Interaction**

School of Engineering: Electro-Optics and Photonics

Oral Presentation - Graduate Research

**PRESENTERS** Hongwei Chen

**ADVISORS** Qiwen Zhan

**LOCATION, TIME** Fitz Hall 580, 1:40-2:00

Metamaterials are artificial media engineered to have the unusual electromagnetic (EM) properties that are not found in nature. We demonstrate a dipole with circular polarization located in an isotropic material, right against a metamaterial with a hyperbolic dispersion relation in two dimensions, the EM waves will be guided into two different directions dependent on the polarizations of the incident illumination. It is crucial to control the photonic emission by single emitters in nanophotonic systems for quantum information processing. The presented work of spin controlled directional emission introduces a new route to steer the direction of the EM waves, which also provides a great opportunity for compact polarization-tunable unidirectional manipulation of EM waves and nano-particles. Other applications may exist in arbitrary polarization detection.

### **Probing Metal-Induced-Gap-State Electrons and Photon-Assisted-Tunneling Electrons at Metal-Insulator Interfaces by Harmonic Generation**

School of Engineering: Electro-Optics and Photonics

Oral Presentation - Graduate Research

**PRESENTERS** Raihan Hussain

**ADVISORS** Imad Agha, Joseph W Haus

**LOCATION, TIME** Fitz Hall 580, 2:10-2:30

The ubiquitous presence of metal-insulator (MI) and metal-insulator-metal (MIM) interfaces in electronic and optical devices make

them technologically very important and necessitate an understanding of their fundamental properties. We experimented on Insulator/Au and Au/Insulator/Au interfaces. First, the insulator ( $Al_2O_3$  or ZnO) layer was deposited on planar Au samples using atomic layer deposition (ALD) technique to form MI interface. Later, Au nanoparticles (AuNP) of diameter 10nm were immobilized on the insulator layer to prepare MIM interface. SHG and THG from both of these interfaces were used for our analysis. The goal of our experiment is twofold: a) Measuring delocalized electron density at MIGS using SHG, b) Measuring field enhancement due to PAT theory using the changes in THG as well as no-change in SHG efficiencies.

## A Risk Analysis Framework for Evaluating On-Site Wastewater Treatment Systems

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Alexis Latise Wingfield

**ADVISORS** Kellie R Schneider, Dr. Rodney Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Beaver Water District in Lowell, AR provides clean, safe drinking water to more than 300,000 residents in Northwest Arkansas. As a water utility, the Beaver Water Department is concerned with the potential of on-site systems (septic tanks) contaminating Beaver Lake – the area's primary source of drinking water. The purpose of this study is to develop a framework to assess the risk potential of on-site wastewater treatment systems in the Beaver Lake Source Water Protection Area. Through a multi-year collaboration, more than 2,400 septic tank permits across two counties have been located, digitized, and used to create a geodatabase. Information from the geodatabase including the geophysical characteristics and system design of each septic tank are considered when assessing a system's risk of contaminating Beaver Lake. Our risk framework, initial risk assessment, and potential intervention areas are presented.

## Performance Evolution of GPU versus CPU in Iterative algorithms

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Hassan Ali Alsaad

**ADVISORS** Mohammadjafar Esmaeili

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

High-performance computing is one of the most demanding technologies in today's computational world with a variety of applications such as big data analysis, and solving complex computing algorithm. Engineers have invented multiple technologies such as CPUs, GPUs, GPGUS, FPGAs, clusters and distributed high-performance computational systems for high-performance computing. This research has focused on evaluating GPU and CPU two of the main technologies that could be used in high-performance computing. The researchers have developed a methodology to evaluate the performance of GPU and compare it with CPU under different test subjects. Finally, this research illustrated the power and weaknesses of GPU over the CPU under certain circumstances.

## Using Strategic Business Process Architecture Models to Create a Process Architecture Reference for the Healthcare Industry

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Baxter Rechten

**ADVISORS** Sandra L Furterer

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Strategic Business Process Architecture (SBPA) models identify the key elements and their relationships that can be used to document, design and improve operational processes across any process type or industry. The critical SBPA process architecture elements was previously combined with a traditional process map to develop a novel process architecture mapping tool enabling the capture of important elements needed to design streamlined processes. The goal of this research project is to apply the process architecture meta models and the process architecture mapping tool to the healthcare industry, and subsequently develop a standard healthcare process architecture reference model. The process architecture reference model can be used by healthcare organizations as a basis for process management, including to document, design and improve their processes to provide excellent patient care.

## Desert Storm 1990

School of Engineering: Engineering Management, Systems, and Technology

Oral Presentation - Independent Research

**PRESENTERS** Hussain A M H H Alhabib, Abdulaziz Almajed, Mostafa Mohammad Almousawi, Ali S A M H M Baqer

**ADVISORS** Sean Albert Falkowski, Scott J Schneider

**LOCATION, TIME** Kennedy Union 310, 10:30-10:50

the presentation will be about desert storm (The Iraqi invasion of Kuwait) in 1990. the power point technique will be used and the full story will be presented. The war is also known under other names, such as the Persian Gulf War, First Gulf War, Gulf War I,

Kuwait War, First Iraq War or Iraq War, before the term "Iraq War" became identified instead with the 2003 Iraq War (also referred to in the US as "Operation Iraqi Freedom"). The Iraqi Army's occupation of Kuwait that began 2 August 1990 was met with international condemnation and brought immediate economic sanctions against Iraq by members of the UN Security Council. Together with the UK's prime minister Margaret Thatcher (who had fiercely resisted the invasion by Argentina of the Falkland Islands a decade earlier), George H. W. Bush deployed US forces into Saudi Arabia, and urged other countries to send their own forces to the scene. An array of nations joined the coalition, forming the largest military alliance since World War II. The great majority of the coalition's military forces were from the US, with Saudi Arabia, the United Kingdom and Egypt as leading contributors, in that order. Kuwait and Saudi Arabia paid around US\$32 billion of the US\$60 billion cost. Two of the presenters will explain their part of the story as they were there.

## Rapid Prototyping and Development for The Internet of Things

School of Engineering: Engineering Management, Systems, and Technology

Oral Presentation - Course Project, 201810 ECT 465 01

**PRESENTERS** David Alexander Alfano

**ADVISORS** Mohammadjafar Esmaeili

**LOCATION, TIME** Kennedy Union 207, 1:00-1:20

Development for and around internet connected devices and sensors has exploded over the past two years, and as a result companies are rushing to bring new connected devices to market. Rapid prototyping of product concepts is a crucial part of this process, and there are a variety of free and low cost tools available to aid engineers, developers, and individuals with prototyping. This presentation will focus on the \$35 Raspberry Pi single board computer and the free Node-RED graphical programming suit to demonstrate the speed and ease with which ideas for internet connected devices can be implemented, proved, and tested, both on a hardware and software level. Participants will leave this presentation with the knowledge needed to obtain data from a variety of sensors and then analyze, visualize, and store that data to the cloud.

## Leadership and Diversity of Professionals Working in Healthcare

School of Engineering: Engineering Management, Systems, and Technology

Poster - Graduate Research

**PRESENTERS** Emily E Kloos

**ADVISORS** Sandra L Furterer

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This study relates to previous research done to find out why women engineers leave engineering. It is said that women make up more than 20% of engineering school graduates and yet only 11% of practicing engineers are women, despite various efforts to address the gender gap. Through research, it has been found that many women engineers move from manufacturing and other engineering facilities to service industries such as Healthcare. The purpose of this research is to take the past research done and find out if women engineers working in Healthcare face the same issues as the women engineers in manufacturing or similar environment. 58% of the Healthcare companies are non-profit, 22% are owned by government and 20% are investor owned. There are about 3100 hospitals in Health systems in the United States. Healthcare centers in the United States will be contacted through e-mail, LinkedIn or by appointment. The research topic will be discussed with the management/HR teams at each center to see if they are interested to participate in this study. A survey has been created to distribute to the participating centers. The target respondents for this study are women with an undergraduate degree in engineering but will also use other men and women currently working in Healthcare. We are expecting over 30 Healthcare centers to participate and will compare results of those who never entered engineering field to women who had worked in an engineering field in the past. The survey results will be collected through Google Forms and the results will be compared to the findings in previous research articles.

## Cluster Computing with the Raspberry PI

School of Engineering: Engineering Management, Systems, and Technology

Poster - Course Project, 201780 ECT 466 01

**PRESENTERS** Ali Hussain Alwahimed

**ADVISORS** Mohammadjafar Esmaeili

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

No abstract submitted.

## Performance Evolution of GPU versus CPU in Iterative algorithms

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Hassan Ali Alsaad

**ADVISORS** Mohammadjafar Esmaeili

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

High-performance computing is one of the most demanding technologies in today's computational world with a variety of



applications such as big data analysis, and solving complex computing algorithm. Engineers have invented multiple technologies such as CPUs, GPUs, GGPUS, FPGAs, clusters and distributed high-performance computational systems for high-performance computing. This research has focused on evaluating GPU and CPU two of the main technologies that could be used in high-performance computing. The researchers have developed a methodology to evaluate the performance of GPU and compare it with CPU under different test subjects. Finally, this research illustrated the power and weaknesses of GPU over the CPU under certain circumstances.

## Waiting and Service Time Optimization During Lunch at Milton-Union Elementary School Cafeteria, Dayton, OH

School of Engineering: Engineering Management, Systems, and Technology  
Poster - Capstone Project

**PRESENTERS** Saud Abdulaziz M Alshaikh, Emma Raye Trappe

**ADVISORS** Sandra L Furterer, Daniel J Zalewski

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Long waiting time by itself is a bad experience, but when you couple it with a limited available time to have lunch, that is a recipe for disaster. Milton-Union Elementary School found this out the hard way, as they were trying unsuccessfully to run their lunch process in a timely manner. Apparently, dealing with little, hesitant, uncertain kids about their meal choices, along with the constraint of time was a bit hard to intake by the teachers and lunch worker, ending up with kids being yelled at and continuous complaints by the teachers. There are high school and middle school students in the same building. They are using the same cafeteria for their lunch and they eat before the elementary school. The management stated that the only problem being encountered is with the elementary school students finishing their lunch effectively in a timely manner. There are 679 students in the elementary school distributed over 32 classes. Each class has 30 minutes for lunch followed by another 30 minutes for recess. To manage all schools lunch timing, all students at elementary school must finish their lunch within 90 minutes starting at 11:25 AM. Two lines are there to serve the students and all classes are scheduled to be released in batches with two classes per batch. Those batches are separated by 3-5 minutes as an effort to reduce the long-stacked waiting queue, which normally considered as part of that 30 minutes of lunch. Each lunch line has two servers and one cashier, except for line 2 where there is one more cashier for a limited time only (from 11:25 AM to 12:20 PM). Management believes that elementary students need at least 20 minutes to eat their lunch, otherwise they will consume less of their entrees, vegetables, and milk which means that the kids won't meet their nutritional needs. Moreover, this often leads having an unsatisfied child for the rest of the day beside the posed long-term health risks to students. Unfortunately, management tried several improvement tactics to have the waiting and service time not exceeding 10 minutes with no success. As stated by the management, that time may exceed 15-20 minutes which is usually associated with teachers being tense and nervous beside having a chaotic environment. Other problems have been disclosed by the management as well. Dining space was one of those problems as there are not enough seats for all students. There are 16 handicap accessible seats that are currently not utilized at all. Too many choices for entrees was one of the problems as well. A third one was the layout of the cafeteria lines that could be improved. The objective of this research is to maintain the average time of waiting plus service to be equal to or less than 10 minutes by April 23rd, 2018. The research will consider the future growth as well of the elementary school to its recorded capacity.

## Advance cooling feedback system

School of Engineering: Engineering Management, Systems, and Technology  
Poster - Course Project, 201751 ECT 408 61

**PRESENTERS** OMAR Mohammed Alokali

**ADVISORS** Mohammadjafar Esmaeili, Jim E Globig

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

it is an advanced cooling feedback control system, attached with a motor control..

## Data Mining Approach for Estimating Residential Attic Thermal Resistance from Aerial Thermal Imagery, Utility Data, and Housing Data

School of Engineering: Mechanical and Aerospace Engineering  
Poster - Graduate Research

**PRESENTERS** Salahaldin Faraj Alshatshati

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Conventional residential building energy auditing needed to identify opportunities for energy savings is expensive and time consuming. On-site energy audits require quantification of envelope U-values, air and duct leakage, and heating and cooling system efficiencies. There is a need to advance lower cost automated approaches, which could include aerial and drive-by thermal imaging at-scale in an effort to measure the building U-value. However, the thermal imaging approaches implemented to date, all based upon thermal-physical models of the envelopes, to estimate the U-values of walls require additional measurements and analysis prohibiting low-cost, at-scale implementation. This research focuses on interpreting aerial thermal images to estimate the U-value of roofs. A thermal-physics model of a ceiling is developed to show the difficulty in using the same approach used by others for walls, as new parameter estimates and thus more measurements would be required. A data-based methodology instead is posed. This approach integrates the inferred roof temperature measurement, historical utility data, and easily accessible or potentially easily accessible

housing data. A Random Forest model is developed from a training subset of residences for which the ceiling U-values are known. This model is used to predict the roof U-values in a validation set of houses with unknown U-value. Demonstrated is an ability to estimate the attic/roof U-value with an R-squared value in the range of 0.96 using as few as 24 training houses. The implication of this research is significant, offering the possibility of auditing residences remotely at-scale via aerial and drive-by thermal imaging

## Determining Recovery Response to Slips on a Slip Trainer

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Stephen Thomas McFadden

**ADVISORS** Kim E Bigelow

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Common injuries in the elderly population often result from slipping or falling. A slip is a loss of balance which may lead to an injurious fall. To counter these falls, proactive balance training, which focuses on preventing slips from occurring through physical therapy and environmental modifications, has been tried with mixed results. Reactive balance training, which can increase how well an individual can recover once their balance is upset by a disruption, is a novel method to decrease injuries from falls. However, current reactive balance training is conducted in academic environments with highly expensive equipment. While this training has proved productive, a need has arisen for this reactive slip training to be helpful in clinical settings and provided at a reduced cost. This project is centered around work to design, build, and test a low-cost slip trainer to measure the recovery response of individuals in terms of a reactive step.

## Analyzing the Factors of Performance: Is There a More Precise Way for Trainers to Score an Individual's Form During Exercises?

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Amanda Nicole Delaney

**ADVISORS** Kim E Bigelow

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

As part of a collaborative project, our overall research aim was to gain a better understanding of factors that contribute to successfully predicting performance in a variable environment. My research concentrated on adding objectivity for evaluating the effectiveness of training exercises and assessments that are performed and normally scored based on an expert's rating. The Lock and Load exercise, which resembles the bird dog exercise but is done in a high plank position, was the focus of this study. Biomechanical marker data was recorded with an Xsens Awinda 17 sensor suit for comparison to the ratings of form assigned by the trainer. Analyzing the center of mass and maximum acceleration of the individual allowed for examination of how well the person was balanced, controlled, and in sync throughout the test. This data was then used to determine the accuracy of the form ratings given by the certified trainer involved in the project. Results suggest that other sensor-based outcomes may need to be incorporated in training exercises to provide a better picture that equates to the expert's rating. Analysis of jerk, hip rotation, and coordination plots are the next steps in determining the relationship between the expert's form rating and the true form.

## Data Mining of Smart WiFi Thermostats to Develop Multiple Zonal Dynamic Energy and Comfort Models of a Residential Building

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Abdulrahman Mubarak Q Alanezi, Kefan Huang

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Smart WiFi thermostats have gained an increasing foothold in the residential building market. The data emerging from these thermostats is transmitted to the cloud. Companies like Nest and Emerson Climate Technologies are attempting to use this data to add value to their customers. This overarching theme establishes the foundation for this research. This research seeks to utilize WiFi data from the Emerson Climate Technologies' Helix test house to: develop a dynamic model to predict real time cooling demand and then apply this model to running 'what-if' thermostat scheduling scenarios with the ultimate goal of reducing energy use in the residence or responding to high demand events. The Helix residence, with two thermostat controlled zones for each floor, exists in a temperature/humidity controlled external environment, which can be controlled to simulate environmental conditions present in the hottest to coldest climates. A Design of Experiment approach was used to establish data needed for the model. The control variables in the experiments included: levels for the exterior environmental schedule and levels for the interior setpoint schedules for both zones. Simply, this data enabled data collection for constant or cyclical exterior environmental conditions and constant and scheduled interior setpoint conditions, not necessarily the same for each floor. From this data, a regression tree approach (Random Forest) was used to develop models to predict the room temperature as measured by each thermostat, as well as the cooling status for each zone. The models developed, when applied to validation data (e.g., data not employed in training the model) R<sup>2</sup> values of greater than 0.95. Then, the models developed were utilized for various 'What if' scenarios. Two such scenarios were considered. The first looked at the possibility of using the model to estimate comfort in a demand response event, e.g., when the grid manager

calls for demand reduction. In this case, the heat pump providing cooling would be powered off for some time. The second scenario sought to quantify the cooling savings from use of higher thermostat setpoint during simulated non-occupied periods and for different exterior temperature schedules. The 'What if' predictions are validated with experimental data, thus demonstrating the value of the data-driven, dynamic data solely from smart WiFi thermostat information.

## Understanding the Impact of Fuel Volatility and Viscosity on Gas Turbine Engine Ignition

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Katherine Claire Opacich

**ADVISORS** Joshua S Heyne

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In the current alternative jet fuel certification process, approximately \$3-4 million and 20,000-100,000 gallons of fuel are used over a three to five year period to evaluate the behavior of new blends of fuel within engines. This extended process is not only costly but also carbon intensive. The National Jet Fuels Combustion Program's (NJFCP) mission is to streamline the certification process of alternative jet fuels, which is controlled by a fuel's operability limits for select ignition and lean blowout conditions. For ignition, the propensity of a fuel to ignite is limited by its ability to form a flammable mixture with air near a spark kernel. The fuel properties of viscosity and volatility largely govern this reaction because of their influence on the mean droplet size and vaporization rate, respectively. This research aims to achieve a thorough droplet modeling analysis and surrogate generation that imparts key information about whether viscosity or volatility is the fundamental factor in ignition performance. The proposed work will also supplement the NJFCP's goal of assessing the behavior of alternative fuels within combustors with minimal engine testing. Success of this research will assist the NJFCP in their efforts to accelerate the alternative fuel certification process, promote the de-carbonization of aviation jet fuels, and produce next generation high performance fuels.

## Analyzing the Use of Pressure Sensing Shoe Insoles for Biomechanical Research

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Kevin Michael Nowacki

**ADVISORS** Timothy Reissman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The foot is an especially intricate piece of the already complex human body. In biomechanical research, gait is a popular research topic, but it is hard to demonstrate—or even understand—how the foot articulates. Motion capture is a common way to attempt to analyze how the foot works during gait. This method has shown major improvements in understanding the human foot, but has many limitations. There can be variation on where markers are placed, which lead to varying kinematics, which leads to inconsistent results. A pressure sensing insole could assist in understanding multi-segment foot kinematics. This would allow pressure mapping of the foot throughout the gait cycle. There are limited people and studies that have looked at pressure mapping of the foot through gait using insoles. In collaboration with a company called SensingTex out of Spain, I am experimenting with their product in development to analyze if it could be useful for future biomechanical research. This research will hopefully validate the device, and show it can accurately detect how people are distributing their weight across their foot. The ability to see how and where the pressure is being dispersed throughout the foot during gait can open a lot of doors and create many opportunities for other research moving forward. This research is a pilot study to analyze how the device works, and if it is a viable option for understanding multi-segment foot kinematics. Through initial testing, it was found that the sampling rate of the sensors is not fast enough to get an adequate number of samples during a foot strike. The next steps include increasing the sampling speed of the sensors, and continue testing to compare these data.

## Wearable Cardiac Monitoring

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Sarah V Miller

**ADVISORS** Timothy Reissman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Arrhythmias, or irregular heartbeats, are a very common problem. In the United States alone, it is estimated that more than 850,000 people are hospitalized each year for arrhythmias. One of the most common arrhythmias is atrial fibrillation. Atrial fibrillation is a quivering heart beat that can lead to serious issues such as blood clots and strokes. There are several existing products, such as Fitbits and Apple Watches, that are working towards being able to detect and alert users of possible atrial fibrillation. This project looks into how to improve existing technology as well as how to modify it to detect other forms of arrhythmias.

## Energy GPA in Student Neighborhood

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Saroj Bhattarai

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The University of Dayton houses almost 90% undergraduate student in on-campus residence. The university charges a fixed amount to every student for a semester, that amount covers the utility bills for that semester and no penalty charges even if they waste energy. This may lead to unnecessary use of energy like turning light on when the residence is empty and setting the thermostat set point constant every time. These behaviors can be controlled if an incentive is offered to the students that motivate them to use energy efficiently. This is possible in UD due to unique nature of university housing with separate gas and electric meter. A mathematical model is developed in R-software using the historical electrical and gas usage data from utility provider DP&L and Vectren respectively. This model helps to disaggregate the weather dependent and weather independent energy use. The actual energy use is compared with the baseline, heating and cooling energy use of the student residence. A report card is developed to provide the student with the feedback about their energy usage status and their residence's energy saving level in the student neighborhood. This energy performance report card is sent to every resident via email which contains energy grade for natural gas, electricity and overall energy grade, residence rank in student neighborhood for energy saving, winning residence, and tips for improving the energy grade in the successive months. The residents of the winning residence are awarded a t-shirt and an article of the winning residents in a flyer news as a part of this program to incentivize them. After the implementation of this program, 5 to 10% of carbon emission saving is achieved through natural gas saving and some carbon emission saving in available from electricity saving due to change in student behavior toward energy use.

## Design of a Body-Powered, Variable Strength and Conformable Shape Prosthetic Hand

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Zhipeng Jiang

**ADVISORS** Timothy Reissman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

People with below elbow amputations often wear a body-powered prosthesis due to its affordable cost and the fact that it can improve their ability to do daily activities. While this technology is functional, it poses difficulties when trying to work with a range of different objects. The focus of this work is to improve its versatility by engineering both variable grip strength and changeable gripper shape capabilities into the device. Through mechanism design, the new prosthesis will have user-selected force options, thereby being able to hold objects of different masses. Additionally, exploring conformable-topology gripper designs will enable the ability to be able to grab items of diverse shapes and textures.

## Walker Light for Improved Mobility in Older Adults: Effects and Recommendations

School of Engineering: Mechanical and Aerospace Engineering

Porch Project - Honors Thesis

**PRESENTERS** Lauren Marie Rivera

**ADVISORS** Kim E Bigelow

**LOCATION, TIME** 413 Stonemill Road, 11:00-11:15

As a direct response to a need in our community, this project sought to evaluate the effectiveness of a lighting device for older adult walker users. A staff member at St. Leonard Retirement Community in Centerville approached our team about residents having issues with current walker designs. This thesis focuses specifically on the testing related to the lighting device portion of the larger SmartWalker project. This part of the study sought to compare how older adults who regularly use rolling walkers navigate in darkened environments, such as getting up at night to use the restroom, with and without the walker light device on. To complete this comparison, rolling walker users were studied as they performed a series of walking tasks. These included a walking-speed trial and an object identification trial. Each task was performed under multiple lighting conditions, ranging from daylight to almost completely dark. Speed and distance showed some changes when the lighting device was used, but these changes were not significant increase in mobility when the lighting device was used, compared to when it was not in use. There was no correlation between participant rating of confidence and mobility outcomes. The small number of participants and the great variation of lighting among the different testing locations were factors. The participants confirmed they benefit from increased light, and the majority would be willing to attach and charge the device regularly. Also, 86% of participants agreed that the lighting device was as good as, or better than, using a night light in their room at night. Although the results were not significant under the testing conditions used, in-home testing with more participants should be conducted to determine if lighting devices would aid in increased mobility.

## The STEM Gender Gap: An Evaluation of the Efficacy of Women in Engineering Camps

School of Engineering: Mechanical and Aerospace Engineering

Porch Project - Honors Thesis

**PRESENTERS** Malle Rea Schilling

**ADVISORS** Margaret Frances Pinnell

**LOCATION, TIME** 418 Stonemill Road, 11:30-11:45

It is not uncommon to see a class full of engineering students with very few women in the room. To combat this gender gap,

colleges and universities have employed outreach programs and developed summer engagement opportunities that allow women to explore engineering before they graduate high school. To understand how these programs affect the women who participate in them, a research study was conducted to evaluate the effects week-long engineering camps had on participants through a disseminated survey and observations of activities at both a single-sex female camp and a co-ed camp. Additionally, interviews were conducted with leaders of engineering camps at universities across the nation to better understand the programming and purpose of engineering camps.

## **Out of Site, Out of Mind: An Assessment of State-Level Siting Policies for Wind Power Generation Facilities**

School of Engineering: Mechanical and Aerospace Engineering

Oral Presentation - Honors Thesis

**PRESENTERS** Madalyn Ann Beban

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** Kennedy Union 312, 11:30-11:50

The growth of the on-shore wind industry in the United States over the past decade alone has been monumental, yielding an eight-fold increase in national generation capacity. Economic incentives at the federal and state level coupled with technology advances influencing turbine operation have kept wind energy as a actionable choice for domestic power generation. With increased installations comes conflict. As projects are sited, a greater number of interactions with local communities and ecosystems occur. This project intends to address the conflict between project developers and community members by analyzing state-level wind farm siting policies nationwide. exploring approaches that balance the interests of landowners, community members, industry participants, and relevant stakeholders. Meeting current installation trends with policy that mitigates negative externalities on project surroundings can be done by governing bodies seeking to address these desires. Current siting policies at the state and county levels, where energy generation facility siting authority lies, were examined to locate possible systemic changes in the permitting process. Negative externalities from project siting, specifically social and environmental impacts on project surroundings, were identified. Following this, policy alternatives were compared in order to make recommendations for the best possible approach for creating equity as wind power spreads. With the goal of identifying policy actions for a more equitable siting process, options including permit streamlining, decision deadline implementation, and residential compensation plans, are recommended moving forward.

## **Affecting the Wingtip Vortex by Influencing Wing Surface-Flow Direction**

School of Engineering: Mechanical and Aerospace Engineering

Oral Presentation - Independent Research

**PRESENTERS** Nathan Robert Thomas

**ADVISORS** Sid Gunasekaran

**LOCATION, TIME** Kennedy Union 211, 12:30-12:50

The aerodynamic efficiency of a NACA 0012 AR 4 wing was affected through periodic contours aligned in the flow direction resembling a “wrinkled” texture. Streamwise and cross-stream Particle Image Velocimetry (PIV) were conducted at the University of Dayton Low Speed Wind Tunnel around Reynolds number of 135,000 on the NACA 0012 AR 4 wing with and without surface contours. Wings with 6 contour sections was designed by spline fitting two NACA 0012 airfoil profiles in the spanwise direction. Both 2D (wall-to-wall model) configuration and 3D configuration of the wings were tested to determine the effects of surface contours on the parasite and induced drag of the wing. Streamwise PIV results indicated an increase in momentum deficit in the wake of the mid-contour region due to enhanced boundary layer separation from the upper surface of the mid-contour region. The cross-stream PIV results indicated a decrease in the magnitude of azimuthal velocity, circulation and RMS quantities in the wingtip vortex with the surface contours. The reduction in the wingtip vortex properties indicates that the contours were effective in blocking the spanwise flow feeding into the wingtip vortex on the surface of the wing.

## **Autonomous Sumo Bot Tournament**

School of Engineering: Mechanical and Aerospace Engineering

Interactive Competition - Course Project, 201810 MEE 298 02

**PRESENTERS** Matthew Thomas Adkins, Bander Saleh Al Yami, Abdullah A Alharbi, Mansour Kh M A H A Almutawa, Austin Lawrence Andwan, Nathan Robert Berner, Adam J Berry, Ben Daniel Berry, Garrett Nichols Bolton, Nathan Thomas Borries, Merrideth Rose Braucher, Jeff Alan Brown, Liam Cregg Budnik, Hamad N M R Bumaryoum, Jimmy Joseph Butch, Jack William Cleave, Austin Patrick Clemens, Ali Ann Danielson, Sam Powell Dasco, Jared Walter Dejonckheere, David Charles Di Staulo, John Michael Dougherty, Alexander Nicholas Duda, Caroline Joan Ellis, Leah S Henkel, Beth Kate Hoffman, Elizabeth I Horner, Kaitlyn Nicole Hoying, Pearson Lee Ihmels, Camden Lee Ives, Matthew Patrick Jensen, Jimmy Michael John, Zach Thomas Johnson, Zack James Jordan, Justin Louis Kareem, Hannah Ruth Kelly, Michael Patrick Kerner, Scot Philip Kingan, Matthew Quin Klein, Michael Robert Komanetsky, John Carl Kunzmann, Ashley Marie Kush, Michael Henry Lander, Mark W Lauterbach, Kevin Robert Lawson, Kathleen G Lehman, Sydney Marie Lundell, Mary Grace Malon, Samuel Charles Marek, Kyle J McGibbeny, Eva Rose McLaughlin, Will Robert Medved, Maria Elizabeth Mescher, Michael Mongin, Jeremy Preston Neff, Amy T Neidhard-Doll, Jacob T Nguyen, Michael H Niese, Grant Henry Noll, Meredith Kathleen Nortz, Justin T O’Neill, Alex Thomas Otto, Liz P Overbeek, Ethan Park Owens, Josh M Panczyk, Nicholas Alexander Pannunzio, Connor Ryan Paxton, Anthony Dominic Petrilli, Mickey Thinkh Pham, Sean Michael Proffit, Timothy Reissman,

Kyle Rudolph, Patrick Neil Ruhala, Kristen Mae Sanson, Joe Edward Schlangen, Thomas Joseph Schlitt, Zachary Robert Schumm, Katherine Grace Sexton, Daniel Jay Sisler, Luke Tomokatsu Stromberg, Adam C Suddarth, Rachael Marie Supina, Colin Robert Theis, Annie Patricia Trotta, Joseph Patrick Vicario, Liam Patrick Walsh, Joe Reed Weeks, Jack Robert Wernet, Colt Anderson Whitman, Cassie Leigh Woodward, Spencer Ashton Wyatt, David William Yackzan, Drake Thomas Yinger, Michael Jeffrey Zawlocki

**ADVISORS** Amy T Neidhard-Doll, Timothy Reissman

**LOCATION, TIME** Science Center Atrium, 2:00-5:00

The Sumo Bot IV Tournament is back at Stander and keeps getting bigger! This year we estimate 44 robots will be competing in a battle royal to see who is the top Sumo Bot. The format is the following: Two robots compete in a head-to-head match following the basic system of traditional human sumo matches. The sole purpose is a pushing match between the two robots to force the other from the Dohyo (Sumo arena). The best-of-3 matches winner moves on to the next round to face their next opponent and the process continues until our new champion is crowned. Some cool notables about the students: Many of the students are engineering sophomores and in their first class for electronics. Not only are they learning how to mechanically and electrically design their sumo robot, but they are also learning how to program their robots to be autonomous while in the Dohyo... meaning no remote controls! So while self-driving cars maybe a thing of the future, self-sumo robots are already here at Dayton! Come cheer on the students and their robots as we showcase their creations.

## **Influence of Reverse Shoulder Implant Positioning on Patient-Specific Muscle Forces: A Simulation Study**

School of Engineering: Mechanical and Aerospace Engineering

Stander Undergraduate Fellowship Awardee

Oral Presentation - Honors Thesis

**PRESENTERS** Kayla Pariser

**ADVISORS** Allison L Kinney

**LOCATION, TIME** Kennedy Union 207, 2:30-2:50

Currently there is not a standardized, objective method for a surgeon to position a reverse total shoulder arthroplasty (RTSA) in a specific patient. Simulation and optimization methods have been used to analyze how surgeries affect muscle function with generic models. However, the effect of patient-specific muscle parameters on modeling realistic muscle function in the RTSA population is unknown. Calibration of patient-specific parameters via optimization is feasible, but can be time consuming. Due to the fast workplace environment, surgeons cannot afford to wait for optimizations to converge. To decrease convergence time and apply these tools clinically, muscle parameter optimizations must be provided a realistic initial guess representative of the patient's muscle function. To our knowledge, previous studies have not established guidelines for adjusting muscle parameter values from literature sources to patient-specific values, but one possible mechanism is reduction of passive force. The purpose of this study was to investigate how much deviation from the literature muscle parameter values is necessary to reduce passive force and produce more realistic muscle activations for patient-specific cases. Patient-specific shoulder models were generated for eight subjects with two different implants. The literature muscle parameter values for the three deltoid muscles were modified via manually chosen scaling factors chosen to reduce passive muscle force and find common factors across all subjects for each deltoid. Following the parameter sensitivity study it was determined that reduction of passive force produced more realistic muscle forces and activations for all subjects. Common scaling factors were found across all of the subjects for two of the deltoids. There was inconsistency among the subjects as to which deltoid required the most parameter adjustment, emphasizing the importance of patient-specific muscle parameter adjustment. Once the parameters were adjusted, the muscle activation and force contribution became more realistic for all three deltoid muscles for all subjects.

## **Mechanical Testing and Finite-Element Modeling of Polymer Composites and Additively Manufactured Thermoplastics**

School of Engineering: Mechanical and Aerospace Engineering

Oral Presentation - Independent Research

**PRESENTERS** Rockford Raymond Bowman, Alex R Elsbrock

**ADVISORS** Robert L Lowe, Tom J Whitney

**LOCATION, TIME** Marianist Hall Learning Space 218, 2:30-2:50

Woven fiber-reinforced polymer composites (WFRPCs) and additively manufactured (AM) thermoplastics have received increasing interest as candidate materials for structural (load-bearing) applications. Our research consisted of two synergistic parts, one experimental and the other computational. The experimental portion focused on fabricating epoxy-fiberglass WFRPCs with different fiber orientations and using tensile testing to determine their mechanical properties. The computational portion builds on punch test experiments previously conducted at UDRI on additively manufactured polyetherimide (PEI, commercially known as "ULTEM"). We focused on developing predictive finite-element models/simulations capable of capturing (and explaining) the novel deformation, damage, and failure observed in these experiments. Solid models of the disk-shaped test specimens were rendered in SolidWorks, meshed in HyperMesh, and modeled using the finite-element software LS-DYNA.

## **Steady-State Modeling of Condensing Units with an Economizer Loop**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Haithem Murgham

**ADVISORS** Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This work presents an engineering model that simulates the steady-state operation of air-cooled condensing units. Packaged, air-cooled, condensing units includes a compressor, condensing coil, tubing, and fans, fastened to a base or installed within an enclosure. To increase capacity, modern condensing units are being equipped with a brazed-plate heat exchanger for an economizer loop, configured in either upstream or downstream extraction schemes.

## Design of a Self-Orienting Solar Array for Small Low-Earth Orbit Satellites

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Eric Matthew McGill

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

As electronics have become increasingly smaller and more capable, small satellites called cubesats are deployed in missions that would have taken much larger spacecraft 30 years ago. To power these satellites while in orbit, a novel solar array design is proposed by which these small satellites may harvest energy. With the inspiration of a sunflower that autonomously faces the sun as it passes overhead, a solar array possessing similar characteristics is desirable. The proposed design could generate more energy during the craft's time in the sunlight by continuously adjusting to face the sun. More energy gathered corresponds to an enhancement of the capability of these cubesats due to the ability to accomplish missions with greater scope than those currently in use.

## Displacement Analysis and Rigid Body Guidance in Spherical Linkages Using $SU(2)$ and Homotopy Continuation

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Saleh Almestiri

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This work seeks to efficiently and systematically model and solve the equations associated with the class of design problems arising in the study of spherical kinematics. To accomplish this, the group of special unitary matrices,  $SU(2)$ , is utilized.  $SU(2)$  is used to analyze and synthesize the kinematics of a variety of systems including the three-roll wrist, the spherical four-bar mechanism, and the spherical Watt I linkage. Two methods of formulating the synthesis problem are considered. Specifically, the five orientation synthesis of a spherical four-bar mechanism and the eight orientation task of the Watt I linkage are solved using both the loop closure equations and an approach derived from the dot product that recognizes physical constraints within the linkage. Finally, using  $SU(2)$  readily allows for the use of a homotopy-continuation-based solver, in this case Bertini. The use of Bertini is motivated by its capacity to calculate every solution to a design problem.

## Development and Actuation of a Shape-changing Rigid-body Human Foot Prototype

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Tanner Rolfe

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project focuses on the actuation of a multi-segment rigid body foot prototype capable of matching the change in profile of a human foot during gait. Previous work has focused on the design of the prototype using methods of shape-changing kinematic synthesis. In order to actuate the prototype, a tendon-based actuation scheme was conceived and partially implemented. The current prototype includes a series of paired cables, each connected to a separate segment of the foot. Tension in the cables counteracts the force of torsional springs implemented at the joints keeping the segments positioned in a neutral configuration, allowing each segment to achieve appropriate plantar- and dorsiflexion to match gait-derived configurations. Current work focuses on implementing active elements to drive the cables, as well as refinement of joint stiffness to increase the functionality and biomechanical accuracy of the prototype.

## Validating the Location and Tracking of a Human's Center of Mass Using a Statically Equivalent Serial Chain

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Luke Evan Schepers

**ADVISORS** Andrew P Murray, David A Perkins

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project seeks to validate the use of a statically equivalent serial chain (SESC) in locating and tracking a human's center of mass (CoM). The statically equivalent serial chain used in this project is comprised of 13 parameters, each roughly corresponding to a portion of the human body. Given these 13 parameters, the SESC points directly at a person's CoM. Every individual has a unique set of parameters to calculate their SESC. These parameters are determined by capturing poses and using the body segment length and position information, as well as the center of pressure reading, acquired from the different poses. A Wii Balance Board and Xbox Kinect were used in this study as inexpensive force plate and motion capture systems. There are other methods for calculating a person's center of mass, but these require expensive equipment and more complex computational processes. The method proposed here is a low cost, fast, and easy way to accurately predict a person's CoM. In order to determine the feasibility of the SESC model, subjects of varying body types were tested, and SESC predictions for the CoM were checked for both accuracy and repeatability. A minimum number of poses required to achieve an accurate CoM prediction was determined by figuring out where subject parameters converged, which increases time efficiency of the process. Additionally, it was found that the number of frames required to capture a pose could be decreased from 30 to 15 frames without sacrificing accuracy. This resulted in a total testing and setup time of 30 minutes per subject, opposed to one hour previously. Thus, validating the SESC method as a fast, easy, and fairly accurate solution for predicting a human's CoM.

## Experimental Validation and Reliability Testing for Center of Mass Body Tracking

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Kevin Michael Brand

**ADVISORS** Andrew P Murray, David A Perkins

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Determining and then tracking the center of mass is difficult for a connected system of segments, such as a human, animal, or humanoid robot. Available techniques to perform these operations are complicated, time-consuming, or expensive. The technique known as Statically Equivalent Serial Chain (SESC) modeling promises to be inexpensive, using only an Xbox Kinect and a Wii Balance Board for equipment, and quick because only a modest number of subject poses are needed. Although SESC models have previously proven to reasonably estimate the center of mass (CoM) of systems of bodies from a limited number of experiments, recent validation testing shows the capacity for significant improvement. This research aimed to improve upon current testing protocols, reduce sensor error through improved calibration, and refine the algorithm employed to produce more meaningful parameters. As the CoM is an important parameter in gait analysis, SESC methods are prominent when considering in-home rehabilitation techniques that are versatile enough to improve potentially offset CoM problems for people of differing body types and sizes. Due to this significance, the research performed continued the development of the SESC technique toward its use in individualized rehabilitation protocols.

## Dynamic Analysis of Alternative Mechanical Press Linkages

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Hardik Hasmukhbhai Viradiya

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The goal of this project is to compare the dynamic characteristics of alternative linkages for a mechanical press. Mechanical presses are the most common machine used in the mass production of sheet metal parts. Forming sheet metal parts, such as a car door or a tin can, involves striking a flat piece of metal with a die that shapes the part and punctures holes. A conventional press uses a slider-crank linkage and flywheel to provide a high energy strike for a short time period. A motor delivers torque to a flywheel that in turn, provides the rated capacity (tonnage) during the strike. Certain operations, such as deep drawing, require a longer dwell time than is possible with the slider-crank design. Various alternative linkages are proposed that have the ability to provide long dwell times. A dynamic analysis of each linkage is essential to understand motor demands, joint loads, and efficient design options. The linkage analyses are performed using SolidWorks multi-body dynamic simulation software.

## Moving towards tuning of ankle-foot orthoses: The influence of carbon and plastic AFOs for individuals with Multiple Sclerosis

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Sarah Elizabeth Hollis

**ADVISORS** Kim E Bigelow, Kurt J Jackson

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Mobility impairments are reported as the most debilitating symptoms for individuals with Multiple Sclerosis (MS). Fatigue, a major symptom of MS, further affects mobility. Ankle-foot orthoses (AFOs) are one potential solution to alleviate some of these mobility



impairments; however, the effectiveness of AFOs for individuals with MS are currently inconclusive and have known downfalls. We took a comprehensive look at both carbon fiber and polypropylene AFOs to gain an understanding of the immediate effects of AFOs for individuals with MS. In collaboration with the University of Dayton's Doctorate of Physical Therapy Program, data was collected for 10 participants on various balance, gait, and strength/fatigue assessments. Overall, no significant differences existed between the baseline, carbon, or plastic AFO conditions for any assessment outcome ( $p > 0.05$ ); however trends did arise within the static and dynamic balance task results. Many outcome parameters varied among participants, suggesting the importance of individual responses to AFOs and patient preferences in prescribing AFOs. The majority of participants preferred the carbon AFO. All AFOs were off-the-shelf with only slight adjustments to account for fit and alleviate any pain, AFO tuning is believed to help optimize the efficiency of AFOs by adjusting the angle of the shank during midstance and the stiffness of the footplate. The next step in this work is to investigate the effects of AFO tuning in collaboration with area clinical partners. A case study is currently underway to give insight and better understanding to the effects of AFO tuning.

### **Spatial Morphometric Analysis Using Shape-Changing Rigid-Body Chains**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Yucheng Li

**ADVISORS** Andrew P Murray

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Morphometry is the quantitative comparison of shapes, primarily curves. As an alternate to classical methods of spatial morphometry, this work investigates a kinematic synthesis methodology for designing a spatial chain of rigid-bodies to match arbitrary spatial curves. The goal is to find a single set of spatial bodies that can be moved to approximately align with any given set of spatial curves. Previous rigid-body shape-change morphometry work focused on mechanisms composed of rigid planar links connected by prismatic and revolute joints to approximate planar curves. Open space curves are the current focus of the research. The primary advantage of this method is its capacity to describe the difference in space curves with a limited number of parameters.

### **The Development of a Deeper Understanding of Cantera for use in the Simulation of Modern Combustion Problems**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Shane Thomas Kosir

**ADVISORS** Joshua S Heyne, Rob D Stachler

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The emergence of computing, such as multiprocessing and raw processing speed, allows for opportunities to simulate chemical models with relative ease. An open source software module, Cantera, is increasing in popularity within the combustion community as well as among other chemistry and chemical engineering disciplines. This software module can be easily integrated into Python or MATLAB and is often used to simulate problems involving thermodynamics, transport phenomena, and/or chemical kinetics. The purpose of this research is to develop a deeper understanding of physically controlling autoignition processes. The time for a fuel to autoignite, often referred to as ignition delay, is an important measure as it describes the reactivity of a fuel under given conditions. Experiments, such as rapid compression machines and shock tubes, can measure this parameter. These experimental values can be compared to simulations performed in Cantera or CHEMKIN, another chemical kinetic software similar to Cantera, to validate chemical kinetic models of given fuel species. It is of interest to investigate ignition delay as it is a contributing factor to the overall chemical timescale relating to lean blowoff (LBO) in a typical gas turbine engine. LBO represents the lowest possible fuel/air mixture, relative to the stoichiometric ratio, before a flame is not self-sustained and becomes extinguished. A better understanding of the time scales leading to LBO could allow it to be used as a criterion for the approval of alternative (non-petroleum) jet fuels.

### **The GEMnasium Experience: Creating a Recycling Enterprise for Individuals in Recovery**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Course Project, 201810 MEE 460 H1

**PRESENTERS** Abby Schubert Lisjak

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Throughout the Spring semester, Engineering Analysis students have worked in the GEMnasium to explore the creation of a recycling enterprise for individuals in recovery from addiction. This project aims to demonstrate the process taken by the class to design an enterprise that merges wellness activities with work responsibilities. It explores how the enterprise can assist with re-entry as well as the continuation of the recovery process. Wellness, job training, funding, and community input were considered throughout the design process. The recycling enterprise will be presented to Montgomery County officials with the hope to implement the designed program in the county.

### **Improving Cook-Stove Bricks with Organic Material**

## School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Tyler Antonio Dinardo, Brandon Montel Payne, Antonio Keith Thomas

**ADVISORS** Margaret Frances Pinnell

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Ceramic bricks are used all over the world to help build stoves but can prove to be inefficient because of their inability to hold heat, individuals are required to use more fuel that can create harmful fumes. In order to address this a team comprised of teachers and engineers, designed and tested an experiment that used multiple different organic materials that were added to bricks to increase insulative properties by producing more pores in the bricks. These organic bricks were then heat treated then were tested through three-point bend, compression, and porosity tests to determine if adding organic material would create more pores to increase insulative properties without jeopardizing the overall strength of the brick.



**OTHER UNITS**

## Optimization of Density and Surface Finish in Metal Additive Manufacturing

University of Dayton Research Institute: Additive Manufacturing

Poster - Independent Research

**PRESENTERS** Allyson Meagan Cox

**ADVISORS** Jared W Speltz

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Laser Powder Bed Fusion is a type of additive manufacturing of metal parts that uses fine metal powder that is melted together by a high powered laser, layer by layer, based off a CAD model of the desired design. The metal additive field has gained recent and widespread attention for its innovation, customization, and prototyping. However, due to the nature of industries such as aerospace and defense, the demand for quality products is high. Two ways to measure quality of a finished additive part are density and surface roughness. These properties were measured and compared against changing print parameters to determine process settings that yield optimum part quality. Inconel 718 powder was used in the Advances Technology Laser Additive System (ATLAS) to create test pieces with critical geometries in the design. The individual layers of the part were scanned for profilometry data to analyze internal and edge surface roughness. In addition, the final part characteristics were determined using density testing and metallurgy. During the print, volumetric energy density (VED), mark speed, power, hatch design and part design all remained constant. The number of contours around the edge of the design layer and the offset to hatch were altered for each part. These parameters were compared against each other in the results of the experiment to determine the critical settings of an additive manufactured part that would lead to quality finished parts without post processing.

## Bargain Brand Justice: Ohio's Indigent Defense Funding Model Makes Justice Inaccessible and Undermines the Sixth Amendment

School of Law: School of Law

Poster - Independent Research

**PRESENTERS** Ebony D Davenport

**ADVISORS** John P Feldmeier

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In 1963, the Supreme Court of the United States ruled that the Sixth Amendment right to counsel shall not be denied to anyone due to their ability to pay in *Gideon v. Wainwright*. The right to adequate legal representation is a noble one that sets this nation apart from other areas of the world. However, without the proper infrastructure, this right becomes less revolutionary and more decorative. When public defender offices are not properly funded, the most vulnerable among us are denied a fundamental right; justice becomes an experience exclusive to the elite; and the adversarial system is won not by the best advocate, but by the depth of her resources. The county-by-county funding model employed by the state of Ohio has the potential for causing disparities among counties because public defender offices are funded based on property tax revenue. This approach to funding creates a piecemeal system in which one's access to justice depends largely on which county he is arrested. When the burden is shifted to the counties, they struggle to provide for public service like waste management, libraries, and schools. This strain on funding creates a Hunger Games-like situation wherein various public services compete for extra crumbs. Because Ohio's current funding model for indigent defense prevents residents from equal access to justice, thus depriving them of a fundamental right to counsel, a new funding source that is independent from the general fund will allow for (1) counties to be fully staffed, (2) proper expert witnesses that can potentially strengthen a client's defense, (3) reduce excessive caseloads which undermine quality representation, and (4) ensure that *Gideon's* promise is upheld.

## Business that Changed the World and Media Moguls

Center for International Programs: Intensive English Program

Poster - Course Project, 201816 IEP 033 01

**PRESENTERS** Maryam Sulaiman Said SULAIMAN Al Ofi, Hassan Ali A Al Zainaddin, Fahad Y F A A Alduaij, Mahdi M E A H Alsaaffar, Muhammad H H H M Alsarraf, Saleh Mohammed

**ADVISORS** Julie Noelle Gee, Nichole M Lucas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The presenters are students from the Intensive English Program. The posters they have created are representative of an end of term project for the level 3 Oral Communication and Listening/Note-taking course; an intermediate class for English language learning students at the intermediate proficiency level. The goal of this assignment is to give students an introduction to research and an opportunity to improve their speaking and presentation skills.



## **CHRONOLOGICAL ORDER**

organized by start time / unit / department

## Empirical Research Presentations in Economics

School of Business Administration: Economics and Finance

Oral Presentation - Capstone Project

**PRESENTERS** Heather Ann Axton, Najm Olawale Babatunde, Luke Anthony Bir, Ian Joseph Blair, Mitchell Thomas Bloemer, Xavier Bonfiglio, Noah Duane Cable, Michael Thomas Callahan, Summer L Camper, Patrick Eugene Canning, Cameron Allen Cerbus, Xiangyun Chen, Andrew Benner Dewees, Michael Scott Dobak, Matthew Paul Forte, Jack F Glending, Dominick T Golubiewski, Trevor Austin Gonzalez, David William Graf, Kayla P Haberstick, Ryan J Harpst, Evan Mathew Heeter, Jason Henry Hessel, Connor Christopher Larkin, Despina Lawandi, Roy Daniel Lawrence, Geng Li, Wesley Lawrence Luvisi, Nathan Joseph Machel, Christopher Warren Mack, Samuel Jacob Mancini, Clare M Manion, Patrick Nathan Martinette, Tony Joseph Mazza, John Paul McNamara, Emily Anne Michl, Eric J Nascone, Griffin Foster O'Gara, Julie Noelle Pochodylo, Tom Scott Pollock, Vidyaarathi Pugalenthi, Reed E Rayburg, Zachary William Reid, Robert Paul Richardson, Naimeh Osama Saleh, Nicholas Anthony Salerno, Wyatt James Satre, Mitchell V Schleyer, Sarah Elizabeth Sepanski, Michael Robert Sernus, Joshua William Simpson, Alex Marie Stahanczyk, Benjamin Daniel Steinhart, Nathan Peter Stemen, Caroline Grace Stockglausner, Jacob G Strippy, Benjamin D Vasunia, Lucas James Wahlen, Changhan Wang, Jake Austin Warnica, Darian A Washington, Evan J Willmann, Yifei Wu, Yuhui Wu, Bennett Alexander Zynn

**ADVISORS** Nancy L Haskell

**LOCATION, TIME** Miriam Hall 109, 8:30-5:30

Four years of coursework culminate in a written and oral presentation of an empirical research project during the senior capstone course. Students apply economic theory and econometric techniques to analyze data in order to answer an original research question.

## Revealing when, how, and how often a pigmentation gene network evolved to be sexually dimorphic in a fruit fly subgenus

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Abbey Marie Groszkiewicz, Jesse Taylor Hughes

**ADVISORS** Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Since the origin of the 36 recognized animal phyla, evolution can be largely summarized as the diversification of characteristics among these original body plans. As animal characteristics are the products of development, a key challenge for contemporary research is to reveal the ways in which development evolves through changes in the use of genes within a gene regulatory network. One ideal trait for deep mechanistic study is the coloration patterns observed on the abdominal tergites of fruit fly species from the *Sophophora* subgenus. Prior research has supported a scenario where elaborate melanic pigmentation limited to the male abdomen evolved once within this clade through the evolution of a sexually dimorphic pattern of expression for the *bric-à-brac* transcription factor genes. My research seeks to confirm or revise this scenario by bringing attention to the distribution of species with elaborate male pigmentation among the diverse *Sophophora* species groups and interrogating the patterns of *bric-à-brac* expression during the development and coloration of abdominal tergites.

## Using RNA-interference to Identify the Genetic Toolkit for a Fruit Fly Morphological Trait

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Abbey Marie Groszkiewicz, Jesse Taylor Hughes

**ADVISORS** Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Metazoan animal morphological traits result from the combined inputs of hundreds or more genes that comprise gene regulatory networks (GRNs). Each GRN utilizes various genes from the genetic toolkit of transcription factor and signaling pathway genes to control complex patterns of gene expression. However, for few traits, if any, has the full repertoire of toolkit genes been characterized for its GRN. Thus, how traits are built by regulated gene expression remains poorly understood. For my thesis, I am investigating the genetic toolkit that makes a male-specific pigmentation for the fruit fly species *Drosophila melanogaster*. Using RNA-interference, I will reduce the expression of ~190 transcription factor and ~21 signaling pathway genes to find those necessary for this trait by surveying for deviant pigmentation phenotypes. The results will provide a greater understanding of how a GRN is able to direct the formation of a well formed trait.

## Molecular Modeling of Organic Matrix Proteins in Oysters

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Anna Kathleen Benton

**ADVISORS** Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Three organic matrix proteins, Pearlin, Prismalin, and Shematrin, from the shell of the oyster *Pinctada fucata* have been isolated, characterized, and the sequences reported in the literature. These organic matrix proteins are known to interact with one another and with the mineral layers in assembly of the shell, but how the interaction occurs is unknown. This project focuses on molecular modeling of the proteins to discover how this interaction occurs by using the 3D modeling program Chem3D® (PerkinElmer). The molecular modeling program initially displays each protein in the least sterically-hindered conformation. Next, post-translational modifications were made to model the amino acid crosslinking that must occur between the proteins; the introduced post-translational modification is addition of a hydroxyl group to Tyrosine residues to form L-3,4-dihydroxyphenylalanine (L-Dopa) residues. The modifications of changing the tyrosines to L-Dopa were made to the protein sequence at random to identify any combination of alterations that would be most beneficial for the interaction between the organic matrix proteins and the mineral. After an acceptable conformation was found, the protein was replicated in the modeling program. The proteins were then rearranged to determine the most favorable electrostatic arrangement, one with polar regions of the protein interacting with one another. This modeling approach will be used in the future for proteins isolated and characterized from our experimental organism, *Crassostrea virginica*, the eastern oyster.

## Determining the Role of Membrane Fatty Acid Composition in Antibiotic Resistance

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Andrew J Deak

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Bacterial infections that can no longer be treated by antibiotics because of bacterial mutations cause many infections and deaths each year. My research conducted aims to study how membrane fatty acid composition can affect bacterial susceptibility to antibiotics. *Listeria monocytogenes*, a gram-positive facultative anaerobe, is the bacterium that I am testing. *Listeria* has 80-90% branched-chain fatty acids (BCFAs) which allow membrane fluidity and sufficient protection against invaders. When *Listeria* is grown in the presence of butyrate, the BCFAs become straight-chain fatty acids (SCFAs) and make the once fluid membrane more rigid. We believe that this allows for easier antibiotic penetration of the phospholipid bilayer which lets the antibiotics affect cellular processes. By changing concentrations of butyrate I can therefore determine the minimum inhibitory concentrations of antibiotics for *Listeria* with different membrane fatty acid compositions. Moreover, as growth is a key factor in bacterial susceptibility to antibiotics. I also measure oxygen consumption rate in response to butyrate. Higher oxygen consumption rate is indicative of higher bacterial activity. Because oxygen consumption is carried out by protein complexes on the membrane, measuring oxygen consumption rate also reveal the effects of butyrate on cell membrane functionality.

## Characterization of the Glycosylation of Aquaglyceroporin HC-3 in Erythrocytes from the Freeze Tolerant Anuran, *Dryophytes chrysoscelis*

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Dante Laurenti Pezzutti

**ADDITIONAL AUTHORS** James Frisbie, David Goldstein (Wright State University)

**ADVISORS** Carissa M Krane

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Cope's gray treefrog, *Dryophytes chrysoscelis*, is a freeze-tolerant anuran that uses glycerol as a cryoprotectant. In erythrocytes of *D. chrysoscelis*, transmembrane glycerol flux is likely facilitated through the aquaglyceroporin, HC-3. Previous research demonstrated that erythrocytes from cold-acclimated treefrogs up-regulate HC-3 protein expression, membrane localization, and glycosylation. Thus, we hypothesize that anticipatory glycerol accumulation observed in cold-acclimated treefrogs contributes to enhanced post-translational modification of HC-3 via N-linked and O-linked glycosylation, and that HC-3 glycosylation is important in subcellular trafficking of HC-3 to the membrane. Densitometric analyses of immunoblots specific for HC-3 showed a 3.5-fold and 1.9-fold average increase in glycosylated HC-3 from RBCs cultured with the addition of glycerol (CCCM+G) as compared to Freshly Isolated RBCs (FI) and RBCs cultured in CCCM alone, respectively. Western blots of RBC proteins treated with PNGase F resulted in a 1.3-fold average decrease in glycosylated HC-3 compared to control proteins. However, protein treatment with O-Glycosidase and Neuraminidase did not change the abundance of glycosylated HC-3. Additional results were collected using scanning laser confocal microscopy and HC-3 localization was measured in mean fluorescent intensity (arbitrary units) using ImageJ software (N=4-6 cells per experiment). For RBCs cultured in CCCM+G, immunofluorescence intensity of HC-3 in the plasma membrane was 21.7 times greater than HC-3 immunofluorescence in the cytosol ( $P < 0.05$ ). In contrast, immunofluorescence intensity of HC-3 in the cytosol was 3.2 times greater than HC-3 immunofluorescence in the membrane for FI RBCs ( $P < 0.01$ ). Through the use of an in vitro cell culture system, we have recapitulated cold-acclimated in vivo HC-3 expression patterns through the addition of a glycerol-induced hyperosmotic environment to warm-acclimated erythrocyte cell cultures of *D. chrysoscelis*. Thus, in addition to its osmoregulatory role, glycerol may also influence the N-linked glycosylation and membrane trafficking of HC-3.

## Resolving the Molecular Mechanisms by Which DNA Mutations Alter the Function of a Genetic Switch

**College of Arts and Sciences: Biology**

Poster - Honors Thesis

**PRESENTERS** Emily Elisabeth Wey**ADVISORS** Tom M Williams**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Each human genome possesses around a million mutations that are genetic baggage from DNA replication mistakes or “mutations” that occurred in the past. Each mutation can have one of three outcomes on an individual, these are to improve, reduce, or have no effect on health. Moreover, the effects of such mutations can depend on the presence or absence of other mutations, so called epistatic interactions. A major goal of genomic medicine is to glean diagnostic or predictive health information from the genome sequences of individuals. However, this goal remains out of reach as the effects of mutations and epistatic interactions are difficult to predict without knowing the function of the DNA sequence they reside in. This difficulty is especially heightened for mutations occurring in cis-regulatory element sequences that act as switches to control gene transcription. The research I plan to perform for my Honors Thesis is to use a fruit fly model to test hypotheses about the molecular mechanisms by which mutations alter a genetic switch's activity and whether these mutations are subjected to the tyranny of epistatic interactions. I will study the *Drosophila melanogaster* dimorphic element which is a transcription-regulating switch for the *bric-à-brac* genes. Three mutations in the dimorphic element were identified that individually alter the level of *bric-à-brac* transcription. The presence or absence of epistatic interactions will be determined by measuring the activity of dimorphic elements from related species that have been engineered to possess the *Drosophila melanogaster* mutations. I will also test the hypothesis that these mutations impart their effects by creating or destroying binding sites for proteins known as transcription factors. The results will provide a sorely needed example where an understanding of molecular mechanisms bridges the gap between a DNA sequence and its in vivo function.

**Drosophila Eye Model to Investigate How Mutations in OPA1 and Drp-1 Genes Contribute to Neurodegeneration in Alzheimer's Disease**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Elizabeth Ann Borchers, Neha Gogia, Lydia Christine Payton, Ankita Sarkar**ADVISORS** Amit Singh**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's Disease (AD) is a progressive neurodegenerative disorder with no known cure to-date. This disease is caused by the extra-cellular accumulation of amyloid-beta 42 (A $\beta$ 42) peptides, which ultimately leads to results in neuronal cell death. In our study, we have used *Drosophila melanogaster* (a.k.a fruit fly) as our model organism (as its genome is highly conserved with humans and any insights generated here can be extrapolated to humans), and have developed transgenic fly model of AD where human A $\beta$ 42 peptides can be misexpressed specifically in differentiating photoreceptor neurons using GAL4/UAS system, without affecting the reproductive ability and life span of flies. One of the hallmarks of AD is generation of Reactive Oxygen Species (ROS) which triggers neuronal cell death. We have found that (1) there is a strong correlation between increased ROS levels and mitochondrial fragmentation and increased levels of ROS and that (2) a fine balance between both mitochondrial fusion, fission events is essential for normal mitochondrial/cellular functions. Any perturbations, in these process results in increased ROS levels which triggers neuronal death. In our study, we have found two dynamin related GTPases (1) *opa1* and (2) *drp1*, which can regulate mitochondrial fusion and fission events respectively. Mutations in *opa1* (an early stop signal), produces small unstable mitochondrial proteins, and increases ROS levels in neurons. Thus, we hypothesize that *opa1* and *drp1* are involved in regulating A $\beta$ 42 mediated neurodegeneration. To test our hypothesis, we misexpressed *opa1* and *drp1* in A $\beta$ 42 background (using GAL4/UAS system) and checked for resultant phenotypes in the eye. Our results showed that (1) up-regulating and downregulating *opa1* rescues A $\beta$ 42 mediated neurodegeneration only in female flies and in male flies eyes respectively, (2) down-regulating *drp1* rescues A $\beta$ 42 mediated neurodegeneration only in female flies, while (3) up-regulating *drp1* did not result in any eye rescues phenotypes. This study has significant bearings on mitochondria's role in neurodegeneration. Keywords: Alzheimer's Disease, Neurodegeneration, Reactive Oxygen Species, Mitochondrial fragmentation

**Unravelling novel calcium-signaling mechanisms implicated in the neurobiology of learning and memory**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Aikaterini Britzolaki, Joey Edward Saurine**ADVISORS** Pothitos Pitychoutis**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Calcium ions are potent regulators of cell fate, as they carry essential information from egg fertilization to cell death. Neuronal cells are no exception to this; calcium signals are critical for neuronal cell function and survival. Intrinsic calcium-cycling aberrations have a detrimental effect on neuronal cell fate, long-term potentiation, learning and memory. Subsequently, calcium signaling imbalances are associated with a wide range of debilitating neuropsychiatric disorders whose pathophysiological mechanisms are elusive. Our group focuses on unravelling the regulatory mechanisms coupled to calcium handling in the central nervous system. Comprehensive studies have revealed that distribution of calcium in the cell is majorly regulated by the endoplasmic reticulum (ER), and hence the



latter's critical role in maintaining neuronal calcium homeostasis. We have recently identified a novel calcium-regulating protein expressed in the brain and we demonstrate for the first time, its implication in regulating learning and memory processes in the mouse brain. In the context of this presentation we will demonstrate overwhelming molecular and behavioral data to support the pivotal role of this novel calcium-regulating protein in the neurobiology of learning and memory.

## The Role of FNR/CRP Regulators in *Listeria* Aerobic and Anaerobic Production of Listeriolysin O

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Lexi Diane Brezovec

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Listeria* is a dangerous human pathogen transmitted through consumption of contaminated food products. During infections, *Listeria* is exposed to the anaerobic intestinal lumen. However, the mechanisms modulating how *Listeria* responds to the anaerobic environment are not fully understood. I completed experiments to help understand the role of the FNR/CRP family of transcription factors in *Listeria* and their response to anaerobic conditions. I did this by comparing wildtype *Listeria* and mutants deficient in FNR/CRP transcription factors in their ability to produce the toxin, listeriolysin O. If a specific transcription factor is involved, the mutant deficient in that factor would exhibit a different phenotype from the wildtype bacteria. After testing 3 out of the 13 mutants, I found that each mutant, similarly to the WT, produced more listeriolysin O under anaerobic conditions than aerobic conditions. My preliminary results confirm that *Listeria* can regulate listeriolysin O production in response to anaerobic conditions. I will continue my investigations in the future on the remaining 10 mutants, testing the different responses in aerobic and anaerobic conditions.

## Modulation of *Listeria monocytogenes* carbon metabolism by short chain fatty acids

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Diksha Bedi

**ADVISORS** Jeremy M Erb, Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Listeria monocytogenes*, a bacterial pathogen, is associated with foodborne infections in humans. *Listeria* encounters short chain fatty acids (SCFAs) during its transit through the intestine but its metabolic responses to SCFAs are not fully understood. To determine how *Listeria* metabolism is affected by SCFAs, I performed basic microbiology assays, including monitoring optical density, determining acetoin production, and measuring culture pH levels, to assess *Listeria* growth in the presence of butyrate, propionate, and acetate. I also performed preliminary <sup>13</sup>C-NMR assays to provide a more in-depth look into carbon metabolism in SCFA-treated *Listeria*. I found that propionate-supplemented, but not glucose-supplemented, *Listeria* produced significantly more acetoin compared to no supplemented controls. Because acetoin is a product of central carbon metabolism, my result suggests that *Listeria* is capable of changing its carbon metabolism in response to propionate. My preliminary <sup>13</sup>C-NMR results have not revealed how carbon metabolism is altered by propionate and are under current investigation. Further investigation will provide more knowledge in the metabolic mechanism associated with *Listeria* responses to SCFAs during intestinal transit.

## The medial prefrontal cortex is a sex-specific mediator of ketamine's antidepressant action

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Emily Margaret Flaherty, Joey Edward Saurine, Connor F Thelen

**ADDITIONAL AUTHORS** Jonathon Sens, Sara Mohamed

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Diagnosis of Major Depressive Disorder (MDD) has steadily been increasing in recent years and by 2030 this neuropsychiatric disease is projected to be the leading cause of disease burden world-wide. While MDD is more prevalent than ever before, new treatment options are being explored to provide rapid and long-lasting relief. One of the most promising candidates is the non-competitive N-methyl-D-aspartate receptor antagonist ketamine. This drug, in low doses, has been shown to alleviate symptoms of depression within hours in both animal models and treatment-resistant depressed patients. Despite this revolutionary finding, research focusing on the effects of ketamine has been predominantly conducted in males. What's more, recent studies have identified a sex-specific antidepressant response to ketamine making the need for further investigation imperative to ketamine's future role as an effective treatment option for both males and females. In this study, the role of the medial prefrontal cortex (mPFC) in mediating ketamine's antidepressant response was assessed in stress-naïve male and female C57BL/6J mice. It was discovered that ketamine induced male-specific neuromolecular alterations in the mPFC that may underlie the drug's therapeutic effects; these same alterations in protein expression and synaptic spine density were not present in females. Taken together, the data supports that the mPFC may be more important in regulating the male antidepressant response to ketamine whereas other brain regions may play a greater role in orchestrating ketamine's beneficial effects in females.

## The impact of soil micronutrients on the gut microbiome of orthopterans

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Melani Katharine Muratore, Caitlin Joanne Schneider

**ADVISORS** Kathleen A Kargl, Chelse M Prather, Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Nutrient limitation and nutrient-related stress can impact animal growth and abundance. An animal's microbiome can also be affected by environmental and population constraints. The aim of our study is to investigate the role of both macronutrients such as nitrogen and phosphorus, and micronutrients, including sodium, calcium, and potassium, in shaping the gut microbiome of grasshoppers and other orthopterans. Grasshopper and katydid species were obtained from a coastal tall grass prairie in Texas, which was part of a multifactorial fertilization experiment manipulating the presence of macronutrients and sodium, calcium and potassium in all possible combinations, and dissected to harvest the gut, from the crop to the hind gut. We then extracted DNA from 75 orthopteran gut samples and submitted the same for high throughput 16s and 18s sequencing with plastid filtration by Zymo Research. The sequencing results indicated a wide range of species diversity both within individuals and between them. Alpha diversity rarefaction calculations confirmed sequencing saturation in all samples. Results show a relative abundance of *Erwinia*, a genus that includes many plant pathogens. Preliminary analysis suggests a relationship specifically between the presence of sodium, coupled with nitrogen and phosphorus and the relative abundance of *Erwinia*, as well as other taxa. There also appear to be microbiome composition differences between species that are strict herbivores and those that are omnivorous. Our results indicate that both macro and micro nutrients affected the composition of the gut microbiome of these orthopterans and highlight the potential role of the orthopterans in the transmission of plant pathogens.

## Changes in Herbaceous Plant Diversity in an Old-Growth Ohio Forest Before and After Emerald Ash Borer Invasion

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Taylor Melissa Buskey

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The herbaceous layer of eastern North American deciduous forests is an important contributor to biodiversity in this region. One of the greatest threats to herbaceous plant diversity is the introduction of invasive species, which can suppress native species and alter local environmental conditions. *Agrilus planipennis* (emerald ash borer) is a non-native insect pest that has caused a mass death of ash trees (*Fraxinus* spp.) in North America since its introduction to the United States. The resultant changes in canopy structure may affect local conditions and thus have indirect impacts on herbaceous layer composition. Drew Woods State Nature Preserve is a 6-ha old-growth forest fragment in Darke County, Ohio that has recently experienced EAB-related ash mortality. Our goal was to understand how herbaceous layer diversity has been changing through time in response to this sitewide canopy disturbance. Annual surveys of herbaceous biodiversity were conducted across 32 1-m<sup>2</sup> sampling plots from 2012 to 2017. Species richness, total cover, Shannon Diversity, and species evenness were calculated for each plot by year, and beta diversity (Bray-Curtis Dissimilarity) was used to assess community turnover through time. Repeated measures ANOVA was used to test for significant changes over this period, and regression analyses were used to understand relationships between diversity and environmental variables (canopy cover, soil moisture, and distance to forest edge). Species richness and herbaceous cover tended to be higher in more recent sampling years. There was a temporally consistent north-south gradient where diversity tended to be greater toward the southern edge of the stand. These results suggest that EAB-induced ash mortality is increasing light availability via canopy gap formation, which is a driving factor of herbaceous diversity. The full impact of EAB is not yet clear, but will likely extend beyond ash mortality and have important indirect effects on other parts of forest ecosystems.

## Possible pharmacologic glioma treatment in *Drosophila* model

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Luke Alan Bressler, Karishma Sanjay Gangwani, Catherine E Martini, Margarita Rosa Mendez, Isha Mishra, Kirti Snigdha, Jordan M Terschlose

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Glioma is a lethal brain cancer, and current treatment strategies have limited effects by extending life only by a few months. Thus, efforts should be made to discover better inhibitors of glioma growth. Ideally such inhibitors will suppress the progression of glioma by (a) inhibiting the underlying molecular pathways activated in glioma, or (b) prevent rapid proliferation of the glia and other cells that encompass the glioma tumor. We have developed a glioma model by co-activating PI3K and Ras/MAPK specifically in the *Drosophila* CNS glia. The *Drosophila* glioma cause the larval brain to appear enlarged due to rapid increase in the stem cells and their glial and neural progeny. These tumors cause the larvae to enter a prolonged larval phase, and eventually kill the organism. We are conducting a chemical screen using Tyrosine kinase inhibitors (Selleck Biochem.) in which we feed early third instar (72h old) larvae 10 or 300μM chemicals in DMSO and then see effects on glioma growth, and survival in mature third instar stage (120h old). Using

these metrics, here we present data from our screen on B1-B11 of the library. Once we identify potential glioma inhibitors in the primary screens, we will validate them in secondary screens.

## The role of oxygen in antibiotic resistance in *Listeria monocytogenes* and *Staphylococcus aureus*

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Emilee Kay Zoog

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Antibiotic resistance in bacterial pathogens has been a growing concern in recent years as infections that were once easily treated are becoming bigger threats. In agriculture and healthcare, the importance of antibiotic stewardship has been emphasized in an effort to decrease the overuse of antibiotics. Development of novel antibiotics and improvement in current antibiotic testing protocols are two additional avenues being pursued to solve the issue. In this study, I tested the effects of hypoxia on the antibiotic susceptibility in two human pathogens, *Listeria monocytogenes* and five different strains of *Staphylococcus aureus* (USA 300, Romero, COL, Newman, and SH1000), using a standard disc diffusion assay. However, in addition to the standard aerobic incubation, anaerobic incubation was also performed to understand whether hypoxia affects antibiotic susceptibility in these pathogens. My results showed that susceptibility to rifampin, ciprofloxacin, chloramphenicol, and tetracycline increased in an anaerobic environment while susceptibility to erythromycin and bacitracin decreased in an anaerobic environment. *Listeria* was resistant to streptomycin and penicillin in both environments. Similarly, all five strains of *S. aureus* exhibited changes in antibiotic susceptibility during hypoxia. For example, the methicillin-resistant *S. aureus* strain USA300 became more susceptible to rifampin, ciprofloxacin, and penicillin in an anaerobic environment. These results suggest that oxygen levels play a key role in bacteria susceptibility to antibiotics. Therefore, we need to consider the effectiveness of antibiotics under relevant environmental conditions to help antibiotic usage become more efficient.

## Understanding the Link between Sugar Diet and Alzheimer's Disease using *Drosophila* Eye Model

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Jordan Clay Dubbs, Neha Gogia, Ankita Sarkar, Ian Joseph Tobal

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD), is a progressive neurodegenerative disorder and is the sixth leading cause of death in the United States (US), with no cure to date. It is caused by abnormal cleavage of amyloid precursor proteins (APP), generating amyloid-beta-42 (A $\beta$ 42) plaques that trigger neuronal cell death by unknown mechanism(s). Neuroinflammation (body's response to repair, damage and defend against foreign agents) is another characteristic feature of this disease. According to US Department of Agriculture (2017), an average American consumes 94 g of sugar per day which is equivalent to amount of sugar in 2.4 cans of coke. The impact of this high amount of blood sugar can be very significant as breakdown of glucose in high-sugar diet damages the enzymes that regulate inflammation (in immune responses), resulting in mis-regulated neuroinflammation, strokes, and chemical imbalances, and thus may contribute towards AD. In our study, we want to elucidate the effect of both high and low sugar diet on Alzheimer's. To test our hypothesis, we have used *Drosophila melanogaster* (a.k.a. fruit fly), (as genetic machinery is conserved from flies to humans) and developed a fly model of AD, where human A $\beta$ 42 peptides can be misexpressed in *Drosophila* eye using GAL4/UAS system. We placed flies expressing human A $\beta$ 42 in eyes (along with the controls) on regular, low, and high sugar diet and checked the phenotypes in eye imaginal discs, adult flies and collected final death count. Wingless and a soy protein, Lunasin (anti-inflammatory in nature) were also studied to understand their role in progression of AD. Our study shows, that a high-sugar diet displays a more aggressive progression of AD as compared to a normal diet or a low-sugar diet. This research has significant bearings in understanding the potential link between AD and diabetes, as both are very prominent diseases in today's world.

## The Role of Pyocyanin in the Protection of *Pseudomonas aeruginosa* from Singlet Oxygen

College of Arts and Sciences: Biology

Poster - Course Project, 201810 BIO 421 P1

**PRESENTERS** Celeste Claire Bergman, Edward T Eshoo, Grace Kathryn Goulet, Stacey Marie Lapurga

**ADVISORS** Yasuhiko Irie

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Pseudomonas aeruginosa* is an opportunistic pathogen that causes both acute and chronic infections in immunocompromised individuals. *P. aeruginosa* is resistant to many antibiotics, and there is a critical need for novel antimicrobial strategies that are viable for clinical use. Photodynamic therapy (PDT) is currently undergoing clinical trials. PDT involves chemicals called photosensitizers that when exposed to light, produce a highly reactive oxygen species  $^1O_2$ . Singlet oxygen can non-specifically cause damage to all cellular structures of rapidly metabolizing organisms such as bacteria, while slower metabolizing host tissues are less affected. Furthermore, light can be restricted to only afflicted areas, thus limiting the damage to healthy tissues.  $^1O_2$  is naturally produced during photosynthesis, and photosynthetic organisms produce pigmented compounds such as Beta-carotene that can absorb  $^1O_2$  before damaging

the cells. *P. aeruginosa* produces a blue pigmented compound pyocyanin when they grow in high density. In previous study, pyocyanin was discovered to be capable of binding  $1O_2$ . In this project, we hypothesize that *P. aeruginosa* pyocyanin can have a protective role against singlet oxygen. The data from this project can provide an important insight to possible resistant mechanisms against a novel antimicrobial therapy still in development. Understanding the resistance against PDT prior to clinical use can have a significant impact towards shaping how PDT is administered in clinical environments, so that resistant strains do not eliminate PDT as an option the way antibiotics have been eliminated by resistant strains.

## **Determining what environmental features affect waterbird diversity on the Great Miami River**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Hannah Marie Scharf

**ADVISORS** Jeffrey L Kavanaugh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The habitat of the Great Miami River is highly disturbed as it enters the city of Dayton, yet it still attracts many species of birds. These include Anseriformes, which are waterfowl, Charadriiformes, which contain shorebirds and gulls, Pelecaniformes, which contain herons, Suliformes which contain cormorants, and Podicipediformes, which are the grebes. This study seeks to determine which segments of the Great Miami River attract the most and the least numbers and species of waterbirds during the fall migration, and what environmental characteristics set these segments apart. To accomplish this, we divided a four mile segment of the Great Miami River into tenth of a mile intervals, spanning from the confluence of the Great Miami River with the Mad River downstream to the Tait Station low dam. For each interval we counted and identified every bird, in addition to recording environmental features of interest. After identifying the two best and the two worst intervals, we evaluated the habitat with the Qualitative Habitat Evaluation Index (QHEI) and plan to further investigate these areas with additional analyses. By identifying and characterizing these areas of the Great Miami River, sections of the river can be better managed to encourage greater species diversity and numbers of waterbirds.

## **Role of Relish/NFkB Apoptosis Pathway in Amyloid-beta 42 mediated neurodegeneration in Alzheimer's disease**

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Steven Gerard Borchers, Neil William Glenn, Neha Gogia

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD) is a neurodegenerative disease, which affects the mental functions of the patients. This disorder progresses with age and does not have a cure to-date. One of the reasons for the manifestation of AD is the accumulation of amyloid-beta-42 (A $\beta$ 42) proteins. In our study, we have used *Drosophila* as our model organism (as 75% of the genetic machinery is conserved between flies and humans), and have developed a model where when human A $\beta$ 42 is misexpressed in the differentiating eye, triggers cell death in the retinal neurons. We have also identified a soy-based anti-inflammatory protein, Lunasin, which can block A $\beta$ 42 mediated cell death by downregulating the NF $\kappa$ B pathway (which lead to translation of apoptotic proteins of Jun-N Terminal Kinase (JNK) pathway). In order to discern the exact mechanism by which Lunasin prevents neuronal cell death (caused by the accumulation of A $\beta$ 42 proteins), we have developed transgenic flies, which can produce human A $\beta$ 42 and A $\beta$ 42+Lunasin in the *Drosophila* eye. Our hypothesis states that manipulating the Relish protein complex of the Imd-NF $\kappa$ B pathway could lead to activity variation in JNK pathway in A $\beta$ 42+Lunasin flies. To test our hypothesis, we used GAL4/UAS system genetic technique and misexpressed relish and relish RNAi in human A $\beta$ 42, A $\beta$ 42+Lunasin background, and checked for the resultant phenotypes in (1) the larval eye imaginal discs and in (2) the adult eyes. Our data showed that downregulating Relish rescues neurodegenerative phenotypes seen in Alzheimer's flies. It suggests that the Imd-NF $\kappa$ B pathway plays a positive role in Lunasin's ability to mitigate the neuronal cell death caused by the accumulation of A $\beta$ 42 plaques. These studies have significant bearing on the use of NF $\kappa$ B members as biomarkers or druggable targets and generate new insights into the mechanism by which A $\beta$ 42 mediated neurodegeneration cell death can be blocked in the future.

## **Changes in a western Ohio old-growth forest community before and after invasion by emerald ash borer**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Julia I Chapman, Mitchell John Kukla, Corey Michael Kuminecz

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The emerald ash borer (EAB; *Agrilus planipennis* fairmaire) is an invasive insect species in North America that has devastated *Fraxinus* (ash) populations in the Great Lakes region and northeastern U.S.. Many forests are losing a significant number of *Fraxinus*

trees and the implications of this widespread disturbance is not yet clear. The aim of this study is to understand how EAB-related tree mortality is impacting compositional change in a west central Ohio old-growth forest. A set of 32 nested plots were established in Drew Woods State Nature Preserve in 2011 and used to sample the overstory layer (314 m<sup>2</sup>; stems  $\geq$  2.5 cm diameter at breast height), sapling layer (10 m<sup>2</sup>; stems < 2.5 cm dbh and > 50 cm in height), and seedling layer (1 m<sup>2</sup>; stems < 50 cm in height). These plots were resampled in 2017 to investigate the composition of tree species over seven years during which the majority of *Fraxinus* trees died from EAB infestation. In the overstory, basal area of live *Fraxinus* decreased from 151.4 m<sup>2</sup> ha<sup>-1</sup> in 2011 to 1.68 m<sup>2</sup> ha<sup>-1</sup> in 2017. The basal area of dead *Fraxinus* increased from 33.5 m<sup>2</sup> ha<sup>-1</sup> in 2011 and to 132.3 m<sup>2</sup> ha<sup>-1</sup> in 2017. Further analysis will investigate how the relative abundance and stem density of tree species other than *Fraxinus* have changed during this time period. These findings can provide insight into the future successional trajectory of forests that have been infested with emerald ash borer.

## Beyond the Macro: exploring micronutrients in insect communities

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Kaitlin Marie Gawkins, Meg Elizabeth Gramza

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Macronutrients are widely considered to be an important limiting factor for insect herbivore populations in grassland ecosystems. However, a potential co-limitation by micronutrients has long been overlooked. We are studying the effect of soil micronutrients on herbivore community composition in coastal tallgrass prairies of Texas with a large-scale multi-nutrient, fertilization experiment manipulating Ca, K, and Na in concert with N and P. Initial results indicated that orthoptera abundance and diversity are co-limited by macronutrients and sodium. To determine if these effects arose through the herbivores feeding more heavily on plants with NP and Na added, we used in-lab choice trials with seven species of orthoptera from three feeding guilds with leaves from four plant species (2 grasses and 2 forbs) that were grown in treatments with either ambient soil nutrients or Na, NP, or Na plus NP added. We then determined how much each individual ate of each treatment leaf at the end of the 48 hour trial. With no preference and a choice of 4 leaves, each leaf should make up on average 25% of each individual's total consumption. We compared each individual's feeding to these expected amounts and used pairwise t-tests to determine whether preferences existed. Pooling across all individuals, orthopterans chose the NP+Na leaves significantly more than any other leaf type. This finding suggests that orthopterans respond directly to leaf chemistry changes arising from our treatments and have important implications for management practices: orthopterans are considered major pests to agricultural systems and are controlled with billions of dollars of pesticides annually. However, because NP and Na in soils are both enhanced with current agricultural practices, our findings suggest that humans could actually be causing these insect herbivores to thrive and become abundant in agricultural systems by adding these limiting nutrients.

## Fear no weevil: insect communities as indicators of restoration in an urban prairie network

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Erin Butrica, Amanda N Finke

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Tallgrass prairies are one of North America's most threatened ecosystems, having been depleted to 4% of its original range. Because of this, conservationists have been working to protect the remaining prairies, as well as restoring and constructing new ones. However, studies are showing that these restored and constructed prairies may not support the same biodiversity and ecosystem services as natural prairies. Most of the biodiversity within these prairies is composed of arthropods. We determined how insect communities from remnant prairies (n=5) compare to that of constructed prairies (n=5) and old fields (n=4). At each site, we collected 4 samples of arthropods by sweepnetting 25 times each, pooling samples, and identifying all individuals to order. We also sampled plant and soil community characteristics. We saw that habitat type affected the number of Coleoptera (beetles), with more beetles in remnant prairies than restored or constructed prairies. Individuals from this order were identified to family, and we saw higher numbers of Phalacridae (shining flower beetles) and Curculionidae (weevils) in the remnant prairie sites. Because few studies look at organisms other than plants to determine success of restoration efforts, we see these beetles as potential indicator species that may help land managers in determining the success of prairie restorations.

## Stimulating anaerobic respiration primes anaerobically grown *Listeria monocytogenes* for intracellular growth

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Nathan C Wallace

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Listeria monocytogenes* (*Listeria*) is a Gram positive facultative organism whose lifestyle ranges from a saprophyte to an enteric intracellular pathogen. *Listeria* is generally ingested from contaminated food products, and as it transmits through the gastrointestinal tract its environment becomes increasingly anoxic. Currently it is not clear how *Listeria* adaptations to the fluctuating

oxygen levels contribute to its pathogenesis. Therefore, we set out to understand what role anaerobic respiration plays in *Listeria* pathogenesis. Previous work in our lab has shown that anaerobically cultured *Listeria* has decreased intracellular growth in a tissue culture infection model using RAW264.7 macrophages. We hypothesized that this may be due to anaerobically cultured *Listeria* taking longer to switch from fermentation to aerobic respiration. This hypothesis was supported by the observation that, compared to an aerobic inoculum, an anaerobic inoculum exhibited an extended lag phase during aerobic growth in vitro. Using a tetrazolium reduction assay, we confirmed that anaerobically cultured *Listeria* have decreased reducing power, indicating decreased electron transport chain (ETC) activity. To determine whether the reduced ETC activity under anaerobic conditions is an important factor in *Listeria* pathogenesis, we supplemented the cultures with fumarate as an alternative electron acceptor to stimulate ETC activity and measured listeriolysin O (LLO) production as well as intracellular growth. When we supplied exogenous fumarate to *Listeria*, we noticed an increase in the reducing power as well as LLO production in anaerobically grown *Listeria*, compared to no fumarate controls. Moreover, fumarate supplementation restored the intracellular growth of anaerobically grown *Listeria* to the same level of aerobically grown *Listeria* inside macrophages. These findings point to the crucial role of anaerobic respiration in *Listeria* anaerobic virulence regulation.

### Cracking the Shell: An Investigation of Shell Repair in the Oyster, *Crassostrea virginica*

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Alyssa Ashley Outhwaite

**ADVISORS** Douglas C Hansen, Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Mollusc shell formation has been an intriguing phenomenon for decades and current research efforts represent a paradigm shift in how oyster shell formation occurs. The older model of shell formation suggests a lack of cellular components as transport vectors for organic and mineral components. However, current research focuses on the potential role of oyster blood cells, hemocytes, in moving organic and mineral components to the shell formation front. A protein biomarker, the amino acid L-3,4-dihydroxyphenylalanine (L-DOPA), is unique to the proteins involved in insoluble organic matrix formation. Tracking the location and temporal occurrence of L-DOPA-containing proteins reveals the potential role of cells in shell repair. Three notch-repair experiments were conducted: a short term 36-hour notch-repair study, a mid-term 7-day notch-repair study, and a long term 8-week notch-repair study. At discrete time intervals, selected oyster compartments of hemocytes, mantle tissues, hemolymph, and nascent shell were sampled to determine the spatial and temporal distributions of the DOPA biomarker. Preliminary results show an increase in DOPA concentration in hemolymph from 0 to 48 hours. Conversely, hemocytes show a decrease in DOPA over time, with the greatest amount of DOPA present at 0 hours and a subsequent decrease over the course of repair. Additionally, nascent shell was analyzed during the 8-week study through the use of scanning electron microscopy (SEM). Analysis of the shell surface showed haphazard crystal formation under normal mineral deposition with crystals irregular in size, shape, and general placement. Newly formed shell from a notched specimen at 48 and 96 hours after notching; however, is characterized by directional and more uniformly shaped crystals. Together these results suggest that hemocytes are selectively shuttling and releasing protein resources to areas of shell repair and provide additional support for the cellular mediated shell formation model, where hemocytes play an active role in materials transport.

### *Drosophila Melanogaster* Imaginal Disc Model To Identify And Determine The Regeneration Potential Of Novel *Notophthalmus Viridescens* (Red-Spotted Newt) Genes

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Amr Abdulkarim Alghamdi, Abijeet Singh Mehta

**ADDITIONAL AUTHORS** Luz-Madrigal (Miami University), Panagiotis A. Tsonis

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Notophthalmus viridescens* possess amazing capabilities to regenerate their organs but molecular-genetic mechanism driving regeneration have been hindered due to lack of genetic tools. However, *Drosophila* imaginal discs, the primordia for adult fly structures, exhibit stem cell like potency and serve as powerful genetic tools to address fundamental problems in regeneration. Using this system, we demonstrated the regenerative role of 5 novel newt proteins. These proteins, having new sequence motifs, have no counterparts in public databases, were identified by denovo assembly of newt transcriptome combined with proteomic validation. Using transgenic approach these genes were misexpressed in *Drosophila*, and RNA seq was performed on mRNA sample from third instar larva. Gene ontology terms related to development, apoptosis and cell cycle were highly enriched in the group of differentially regulated *Drosophila* transcripts. To determine their regenerative potential, we misexpressed candidate genes in the early eye mutant background. Surprisingly, these genes exhibit robust potential to replace missing tissues by inducing compensatory proliferation and blocking cell death. Mitotic index fold change being  $6 \pm 1.5$ , and frequency of phenotype rescue was 70%. Using Retinal determination (RD) gene expression we demonstrated that rescued mutant undergo proper differentiation. We found highly conserved Wingless/Wnt, and Jun-N-terminal kinase (JNK) signaling pathway components were downregulated to promote rescue in the domain where candidate genes were misexpressed. These pathways have been implicated in tissue regeneration in *Drosophila*. We further wanted to test if candidate genes can globally trigger regeneration in all tissues, and to address this question we used an established model for regeneration in wing imaginal disc. Our preliminary data from this model demonstrates that regeneration

potential of candidate genes is not confined to the type of tissue or developmental stage. We therefore have identified a novel component of regeneration tool kit in newt that can trigger regeneration response in other organisms by employing highly conserved signaling pathways. In future, these studies can have a significant bearing in the field of tissue repair and maintenance. Keywords: Candidate genes, Newts, Drosophila, Regeneration, Imaginal Discs.

## Growth Regulatory Pathway collaborates with Axial Patterning Genes to regulate Patterning and Growth in Drosophila Eye

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Neha Gogia

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In all the multicellular organisms, organogenesis requires axial patterning to determine Antero-Posterior (AP), Dorso-Ventral (DV), Proximo-Distal (PD) axes. Any deviation in these axes during development leads to congenital birth defects. In our model system, *Drosophila melanogaster* (a.k.a fruit fly), Dorso-Ventral (DV) patterning marks first lineage restriction event. We have identified defective proventriculus (*dve*), an ortholog of SATB homeobox 1 (special AT-rich sequence binding protein 1), as a new member of DV patterning genes hierarchy. We have shown that *dve* acts downstream of *pannier* (*pnr*, a GATA-1 transcription factor), and upstream of *wingless* (*wg*) in dorsal gene hierarchy. Loss-of-function (LOF) of *dve* or *pnr* results in dramatic dorsal eye enlargements, whereas Gain-of-function (GOF) of *dve*, *pnr* suppresses eye specific fate. We have demonstrated that *Wingless* (*Wg*), (1) is downstream target of Hippo growth regulatory pathway (highly conserved) in eye, (2) acts downstream of *dve*, (3) exhibits similar eye enlargement and suppression phenotypes (upon LOF, GOF respectively), and has been shown to play a role in growth. Here, we present that, DV patterning genes interacts with Hippo signaling to regulate their common downstream target, *Wg* during developing *Drosophila* eye. Our data (using GOF, LOF) states that (1) These two unrelated pathways are related and interacts antagonistically, (2) Activating Hippo signaling suppresses *dve*, *pnr* expressing cells, downregulates *Wg* and changes head, antennae specific fate to an eye, (3) Blocking cell death activity of *hpo* (using UAS-*p35*, anti-apoptotic) doesn't affects its ability to undergo differentiation, (4) Growth regulatory pathway regulates the expression of DV patterning genes (*dve*, *pnr* acts downstream of Hippo pathway), and that (5) GOF/LOF of *dve*, *pnr* does not affect the expression of Hippo downstream reporters *diap1* and expanded in developing eye of *Drosophila*. These studies present new genetic interaction between two unrelated pathways to regulate growth and patterning of an organ.

## Two clone system to determine complex signaling between wild-type and A $\beta$ 42 expressing neurons in Alzheimer's Disease.

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Sean T Connelly, Garrett Michael Grissim, Sean Andrew Kelly, Ankita Sarkar

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's Disease (hereafter AD) is an irreversible neurodegenerative disease causing death of millions of elderly people every year. One of the reasons for AD is abnormal cleavage of the Amyloid precursor protein (APP), which forms a 42 amino acid long hydrophobic polypeptide (hereafter A $\beta$ 42) which form aggregates leading to amyloid plaques. This A $\beta$ 42 forms plaque that leads to neuronal cell death. We are trying to understand the genetic underpinnings behind the onset of this deadly disease using *Drosophila melanogaster* eye as our model system. We have generated and optimized a two-clone system in our lab to understand the cross-talk between the plaque forming neurons and the adjacent wild type neurons. The onset of AD initiates with a few neurons which start producing amyloid plaques, which then triggers cell death. One of the questions is: Which neuronal population is affected? Our system utilizes the FLP/FRT mediated recombination to produce two types of neuronal cell population where strong GFP reporter marks the A $\beta$ 42 misexpressing neurons, and the neighboring wild-type neurons are marked by the absence of GFP. Our preliminary data suggests that the A $\beta$ 42 misexpressing neurons survive at the expense of the neighboring wild type cells. Thus, we believe that there are certain signals, which emanates from these A $\beta$ 42 plaque producing neurons towards the wild type neurons, which causes them to die. We have identified evolutionarily conserved Jun-N-Terminal Kinase (JNK) Signaling pathway as one of the genetic modifiers of A $\beta$ 42 mediated neurodegeneration, which induces neuronal death. With the help of our two-clone system, we want to understand which neuronal cells (A $\beta$ 42 misexpressed vs wild type cells) and how, the JNK signaling triggers cell death. We will test reporters and antibodies against the members of JNK signaling pathway to address our hypothesis. Furthermore, identifying the genetic biomarkers of the Alzheimer's disease with the help of our genetic tool can be utilized in finding therapeutic targets in the future.

## Listeriolysin O production is regulated by SCFAs and oxygen in *Listeria monocytogenes*

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Erica Marie Rinehart

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

*Listeria monocytogenes* (LM) is foodborne pathogen that secretes listeriolysin O (LLO), a pore-forming toxin to establish its intracellular life cycle inside host cells. However, how the environment in the intestine that has both an oxygen gradient (low oxygen to no oxygen) and is enriched in short chain fatty acids (SCFAs) effects LM virulence regulation and pathogenesis has not been determined. To better understand LLO production in response to relevant environmental conditions found during LM transit through the intestinal lumen, a reporter strain and hemolytic assays were used to examine the effect of SCFAs on the transcription and the activity of LLO, respectively. We characterized the LM membrane fatty acid composition in response to SCFAs using FAME analysis. This allowed us to examine the role of membranes as an intermediate signal in LM response to SCFAs. In total, we found that that transcription and LLO production was significantly affected by SCFAs and that LM response to SCFAs was influenced by oxygen. Significant alterations in membrane fatty acids were also seen in SCFA-treated LM. Therefore, LM has the capability of responding to the SCFA-rich environment, in both virulence gene regulation and fatty acid metabolism, during intestinal transit and that individual variations in SCFA abundance may contribute to susceptibility to LM infections.

## **The FUN(gi) Kind of Colonization: effects of micronutrients on mycorrhizal association with little blue stem**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Kiersten Paige Angelos, Beth Margaret Fuchs, Kaitlin Marie Gawkins, Shania E Hurst, Emily E Jones, Ryan William Reihart

**ADVISORS** Kathleen A Kargl, Chelse M Prather, Megan A Rua (Wright State)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Arbuscular mycorrhizal (AM) fungi are ubiquitous throughout the plant kingdom, and particularly important in grasslands. AM fungi deliver mineral nutrients such as nitrogen (N) and phosphorus (P) to plants in exchange for carbohydrates. Despite this important role in N and P cycling, their interactions with micronutrients, like calcium, are largely unexplored. Interactions with calcium (Ca) may be particularly important because of its role in the intracellular signaling system that helps hyphal tip growth. We determined how additions of Ca both alone and in conjunction with N and P affect the colonization rates of AM fungi in little blue stem (*Schizachyrium scoparium*). This perennial grass is a dominant graminoid in prairies across the US, including our study site, a coastal tallgrass prairie in Texas. Using a carbon steel soil auger (7.2cm diameter), we sampled *S. scoparium* roots in a large-scale (30m x 30m plots), factorial-designed fertilization experiment that manipulated Ca and N&P (n=8 replicate plots x 4 *S. scoparium* individuals x 4 treatments=128 total root samples). Each sample was washed to isolate root samples and stained with trypan blue, and we determined AM fungal colonization by quantifying the number of arbuscules, hyphae, and vesicles for each individual. We saw that Ca with N&P had significant effects on the overall rate of AM fungal colonization. We also saw independent effects of each nutrient on the degree of hyphal and vesicle colonization in the roots of *S. scoparium*. Taken together, these results suggest that AM fungi may benefit from Ca inputs, but this does not extend to an increased positive effect on the plant. Better understanding its role in belowground and aboveground processes is crucial to maintaining ecosystem functioning. This work represents an important first step to understand more fully the effects of micronutrients on mycorrhizal fungi in terrestrial ecosystems.

## **Role of M1BP in eye development of *Drosophila melanogaster***

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Hannah Corinne Gordon, Abijeet Singh Mehta, Ankita Sarkar, Kaitlyn E Strickland

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Regulation of transcription in multi-cellular organisms is responsible for generating diversity in cell type and final patterning and growth of an organ. The regulation of gene expression can be present at multiple levels like assembling pre-initiation complex at promoters or regulation of gene expression by micro RNA. Recently, a novel transcription factor M1BP (TF; Motif 1 binding protein) has been identified which is required to regulate a large class of paused genes. However, the role of the Motif 1 binding protein is unknown in the eye development. We employed *Drosophila melanogaster* eye model to understand its role in patterning, growth and development. M1BP is highly conserved across the species and encodes a 55kDa protein containing five C2H2 zinc-fingers domains. A battery of highly conserved genes regulates *Drosophila* eye development. In our studies, we examine the effects of Motif 1 Binding Protein (M1BP), and its effects on the control of gene expression during eye development of the *Drosophila melanogaster*. Our preliminary data suggests that absence of M1BP function in dorsal and ventral eye margins results in the suppression of eye fate and the suppression of the gene from the entire eye gives us a head loss phenotype. We also hypothesize that the loss of function of M1BP leads to the change of the fate of peripodial epithelium cells to disc proper in the eye imaginal disc. The above data will be presented in our poster.

## **Understanding how the loss of *Dronc* function affects apoptosis**

College of Arts and Sciences: Biology

Poster - Course Project, 201810 BIO 421 P1

**PRESENTERS** Karishma Sanjay Gangwani, Hannah Marie Scharf, Kirti Snigdha



**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Cancer is caused by mutations in cells that disrupt signals for growth and division. Apoptosis, a system of programmed cell death, is controlled by genes and impacts cell survival, proliferation, and differentiation. Dysregulation of apoptosis is a significant cause of cancer, as mutated tumor cells show uncontrolled growth and elude cell death. Because of this, it is crucial to study how the genes involved in cell growth and death pathways become dysregulated in a way that causes tumor creation, so that cancer biology can be better understood and possible therapeutic measures can be pursued. One pathway commonly dysregulated in human tumors, the Hippo pathway, was identified in *Drosophila melanogaster* and is conserved evolutionarily in humans. Former research in our lab has shown that the Hippo pathway interacts with initiator caspase Dronc, which is the first target gene to be negatively regulated by this pathway, in the regulation of apoptosis. We hypothesize that loss of Dronc function would enable unchecked cell proliferation. To assess this, we are using RNAi to interfere with Dronc expression. We will also use markers like cyclin A, B, and E to evaluate cell proliferation through immunostaining and confocal microscopy. Here we present our findings on the how the loss of Dronc affects cell proliferation.

## Post-Freeze Viability of Erythrocytes from *D. chrysoscelis*

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Loren Vanessa Geiss

**ADVISORS** Carissa M Krane, Clara do Amaral, James Frisbie, David Goldstein

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Cope's gray treefrog, *Dryophytes chrysoscelis*, is a freeze tolerant frog that survives the freezing of extracellular fluids during winter. Throughout the fall months the frogs are exposed to a gradual decrease in temperature, becoming cold-acclimated. Cold-acclimated treefrogs have elevated plasma levels of glycerol and urea, solutes that function as cryoprotectants by reducing the intra- and extracellular flux of water during freezing and thawing. To minimize cell damage, glycerol and urea need to be taken up by erythrocytes through a transmembrane protein, aquaglyceroporin HC-3. It is hypothesized that erythrocytes frozen in solution containing glycerol/urea would have greater post-freeze (PF) viability than cells frozen without glycerol or urea. It is further hypothesized that cells frozen with naturally accumulating, and HC-3 permeating, solutes (glycerol and urea) would have enhanced PF viability compared to cells frozen with solutes that do not accumulate during cold acclimation (glucose, NaCl, sorbitol). In this study, erythrocytes were obtained from warm-acclimated (22°C) or cold-acclimated (4°C) frogs. Cells were suspended in phosphate buffered saline (PBS) ± solute and incubated for 30 minutes at -8°C. Percent hemolysis was calculated as the amount of hemoglobin leaked from erythrocytes over the total amount hemoglobin in the erythrocyte sample. PF viability was 2.6-fold greater in cells from cold-acclimated frogs compared to cells from warm-acclimated frogs. Cells from warm- and cold-acclimated frogs enhanced PF viability when frozen in PBS containing urea (2.8-fold,  $p < 0.005$  and 0.6-fold,  $p < 0.001$ , respectively). PF viability of cells frozen in PBS containing glycerol improved when cells were from cold-acclimated frogs (0.6-fold,  $p < 0.005$ ). Although results support the involvement of glycerol and urea in the cryoprotection of *D. chrysoscelis*, enhanced viability of cells from cold-acclimated frogs, compared to cells from warm-acclimated frogs, suggest that changes other than glycerol and urea accumulation are involved in the freeze tolerance of *D. chrysoscelis*.

## Understanding the Repopulation of Glioblastoma in *Drosophila* Model System

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Leah Dawn Bullock

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Glioblastoma Multiforme (GBM) is the most common form of malignant brain tumors, accounting for about 52% of primary brain tumors. Patients diagnosed with GBM typically die within a few months after diagnosis. Standard treatment consists of surgery, radiation therapy, and chemotherapy. GBM has an unfavorable diagnosis due to the high rates of tumor recurrence. The cause of the repopulation of the tumor after treatment is currently unknown; therefore, there is a need to study the repopulation of GBM in more detail. We have created a simple glioma model in *Drosophila melanogaster* to study the effects of treatment on tumor size and repopulation of the tumor. We have created the glioma model by suppressing Pten while overexpressing oncogene Ras in glial cells in order to induce a tumor. Flies with genotype UAS<sup>Pten</sup> RNAi; UAS<sup>Ras</sup>V12; Repo Gal4 UASGFP developed aggressive brain tumors and failed to survive to the adult stage. 1st instar larvae of this genotype were exposed to different dosages of X-ray radiation to study the radiation sensitivity of glioma larvae. We utilized 3.5 Gy of radiation to carry out further experiments. We found there is a significant reduction in tumor size in the larvae exposed to X-ray compared to the unexposed samples; however, there is still repopulation of the tumor after X-ray exposure. Through the use of immunohistochemistry, we found that there is significant reduction in Glial cells, neuroblasts, and neurons after X-ray exposure. We plan to further our study by looking into the effects of radiation on the ganglion mother cells and dying cells of the brain. Since the pathways in this study are conserved from flies to mammals, these findings can be utilized in other model systems and in humans. These findings have the potential to lead to possible treatments for glioblastoma tumors in humans.

## Investigating Cell-Cell Interactions through Wg and Yki signaling in *Drosophila* Glioma

**College of Arts and Sciences: Biology**

Poster - Honors Thesis

**PRESENTERS** Logan Joseph Roebke**ADVISORS** Madhuri Kango-Singh**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Glioblastoma multiforme (GBM) is a devastating form of primary brain cancer with poor prognosis. Capitalizing on the mutations found in GBM patients and the similarities between mammalian and *Drosophila* genes involved in glial cell biology, *Drosophila* glioblastoma models have been established that show similarities to anaplastic glia from high-grade human glioma. High grade glioma is known to be recurrent and therapy resistant. These aspects of GBM lead us to ask how different genetic signals (JNK, Wg and Yki) contribute to promoting glioma, and if interactions between glioma cells and the neighboring stromal cells play a role in the key aspects of disease presentation- the rapid growth, the therapy resistance, and the recurrent phenotype. So far, we have downregulated Wg and Yki to analyze their effects on glioma growth. Here we present our progress from these studies.

**Wingless, a mediator of crosstalk between Amyloid-beta 42 expressing and wild-type neurons in Alzheimer's disease****College of Arts and Sciences: Biology**

Poster - Graduate Research

**PRESENTERS** Ankita Sarkar**ADDITIONAL AUTHORS** Dr. Julia Kofler (University of Pittsburgh Medical Center)**ADVISORS** Madhuri Kango-Singh, Amit Singh**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD), a common form of dementia and an age related progressive neurodegenerative disorder, manifests as memory loss and reduced cognitive ability. One of the hallmarks of AD is formation of the Amyloid-beta 42 (hereafter A $\beta$ 42) plaques, which triggers oxidative stress due to aberrant signaling and finally results in the death of neurons. However, the exact mechanism causing cell death is still not well understood. We misexpressed high levels of human A $\beta$ 42 protein in the developing fly retina, which mimics AD like neuropathology. In a forward genetic screen, we identified members of highly conserved Wingless (Wg) signaling pathway as modifiers of the A $\beta$ 42 mediated neurodegeneration. Misexpression of negative regulator of Wg like Shaggy kinase (*sgg*) or a dominant negative form of *Drosophila* T-cell factor (*dTCFDN5*) or blocking Wg transport specifically by downregulating Porcupine (using *porcupineRNAi*) rescued A $\beta$ 42 mediated neurodegeneration by reducing the number of dying cells and restoring the axonal targeting from the retina to the brain. It is also known that Wg induces cell death in the early eye developmental stage of *Drosophila*. We therefore want to understand by what mechanism and in which cells the Wg signaling is triggering cell death, whether it's the A $\beta$ 42 misexpressing cells or the neighboring wild type cells. In order to approach this question we have developed a two clone system in our lab to understand the crosstalk between the two cell populations, where we have shown that the wild type neighboring cells are undergoing cell death compared to the A $\beta$ 42 misexpressed cells.

**Investigation of the Role of Mitochondrial Dysfunction as a Trigger for Neurodegeneration in Alzheimer's disease****College of Arts and Sciences: Biology**

Poster - Honors Thesis

**PRESENTERS** Neha Gogia, Lydia Christine Payton, Ankita Sarkar**ADVISORS** Amit Singh**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that affects the cognitive function and memory of those affected. It results from plaques formed by the abnormal cleavage of the Amyloid Precursor Protein (APP), which result in the formation of a 42 amino acid polypeptide, also known as amyloid beta 42 (A $\beta$ 42). Accumulation of these hydrophobic A $\beta$ 42 plaques triggers neuronal cell death in the central nervous system. However, the reason for this abnormal cell death still remains unknown. A possible explanation involves the role of mitochondrial dysfunction, as mitochondria carry out many vital cellular functions in a cell, including ATP production, reactive oxygen species production, and apoptosis. This study uses *Drosophila melanogaster* - the fruit fly - as the model organism, as 75% of the genetic machinery is conserved between flies and humans and much of the information generated using this model can be extrapolated to humans. This study uses an AD fly model in which human A $\beta$ 42 peptides can be misexpressed in the *Drosophila* eye using the GAL4/UAS system. In our study, we have identified (1) alpha-ketoglutarate dehydrogenase and (2) pyruvate dehydrogenase as potential enzymatic modifiers of the human A $\beta$ 42 neurodegeneration. To investigate their effect on Alzheimer's, we used the GAL4/UAS system, and misexpressed the GOF/LOF forms of the genes coding these enzymes along with human A $\beta$ 42 in the fly eye and checked the resultant phenotypes in both larval eye antennal discs and in adults. Our results showed partial rescue in the LOF of alpha-ketoglutarate dehydrogenase, which clearly indicates that the enzyme plays a major role in AD progression. In the future, we will test the GOF of both enzymatic modifiers in further experiments. This study has significant bearings on understanding how certain enzymatic mitochondrial machinery and metabolism affects AD progression.

**Role of Calcium Signaling Pathway in Rescuing A $\beta$ 42 Neurodegeneration in *Drosophila***

## College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Neha Gogia, Chris Y Kang, Dena M Schaeffer

**ADVISORS** Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Alzheimer's Disease (AD) is a neurodegenerative disease, common in more than five million individuals in the United States (US) alone, making it the sixth leading cause of death in the US. While currently there are no cures for the disease, there are many ongoing studies, which are using the *Drosophila melanogaster* model, to find a way to prevent and slow down AD. We have used *Drosophila* as our model organism; *Drosophila* eye as our model organ (due to highly conserved genetic machinery between flies and humans). We have developed a transgenic fly model of AD where we misexpress high levels of human A $\beta$ 42 peptides using GAL4/UAS system approach, using this system, misexpression is targeted in the differentiating photoreceptor neurons in the *Drosophila* eye and can be explained to address questions pertaining to whether activating or deactivating certain pathways can rescue A $\beta$ 42 mediated neurodegeneration. We have found that members of calcium signaling pathway acts as the modifier of A $\beta$ 42 mediated neurodegeneration. In order to test our hypothesis, we misexpressed the loss-of-function form (using RNAi) of six components of calcium signaling pathway (which are *stimRNAi*, *sercaRNAi*, *oraiRNAi*, *inx2RNAi*, *ip3rRNAi*, and *plc 21cRNAi*) in A $\beta$ 42 background in the eye, and observed the effects in both eye-antennal imaginal discs and adult eyes. Our results showed 100% eye rescue with all 6 components of calcium signaling pathway at 29C, which clearly states that inactivation of calcium signaling pathway blocks A $\beta$ 42 mediated neurodegeneration. Previous studies on calcium signaling pathway showed a role in deadly diseases like cancer and other fatal diseases. Our studies show a new role of calcium signaling in neurodegeneration disorder like AD.

## Aquatic macroinvertebrate density in headwater streams with varying intensities of riparian Amur honeysuckle (*Lonicera maackii*) invasion

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Jenea Imani Adams, Eric Bradley Borth, Taylor Melissa Buskey, Julia I Chapman, Kevin Custer, Mitchell John Kukla, Corey Michael Kuminecz, Michelle Nicole Little, Sean David Mahoney, Meg Eileen Maloney, Joseph Michael Murphy, Taylor Marie Sparbanie

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Headwater streams in the midwestern United States are an important ecosystem because they are home to key macroinvertebrate species and serve as the starting point for freshwater river systems. According to the river continuum concept, any terrestrial inputs to headwater streams can influence biotic communities and abiotic conditions downstream. Amur honeysuckle (*Lonicera maackii*) is an invasive shrub species prominent in the midwestern U.S. whose allelopathic properties have proven detrimental to local species biodiversity. We hypothesized that increasing Amur honeysuckle density along headwater streams would alter the diversity of aquatic macroinvertebrate communities. Five sites located in Montgomery and Miami Counties, Ohio were chosen to represent varying *Lonicera maackii* density along the banks of headwater streams: one heavily invaded site, two moderately invaded sites, and two reference sites (little to no invasion). A 30-meter section of stream at each site was divided into five plots that were six-meters long and were used to sample aquatic macroinvertebrates for five consecutive seasons. A dip net was moved across each plot for 60 seconds, and macroinvertebrates were then separated from the collected debris, preserved in alcohol, and brought back to the lab where they were sorted into taxonomic groups. The total number of macroinvertebrates collected did not vary greatly among sites within each season. A preliminary assessment of community composition showed that there was a greater relative abundance of Diptera and Oligochaeta at the heavily-invaded site in fall and winter compared to the moderate and reference sites. The relative abundance of Trichoptera was lower at the heavy site than the moderate and reference sites in fall, spring, and summer. Further analyses are required to understand how community composition varies among the sites and how such differences relate to honey-suckle invasion and macroinvertebrate feeding mechanisms.

## Drivers of Post-Fire Regeneration in Larch Forests of Northeastern Siberia

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Eric Bradley Borth

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Arctic is warming at an alarming rate, a phenomenon which has been causing more frequent and severe wildfires in boreal forests. The Cajander larch (*Larix cajanderi*) forests of Siberia are particularly important because they cover an immense area of carbon-rich permafrost soil, one of the largest terrestrial carbon sinks. The fate of this belowground carbon is intimately tied to the structure of these larch forests. Due to the fact that forest structure is largely determined by the establishment of new seedlings after forest fires, we seek to learn more about how these changes in fire regimes may change the factors that drive seedling establishment. We examine 6 Cajander larch stands in northeastern Siberia that have been burned in the past 15 years. We evaluate the importance of microsites that favor larch establishment (deemed "safe sites"), a concept that has been anecdotally recorded, but not rigorously studied. We analyze the strength of seedling preference by comparing the percentage of seedlings that establish

on safe sites to the percentage of the land area that is covered by safe sites. This analysis is being carried out in burned sites with varying seed availability to determine whether seed limitation affects safe site preference. Based on our current data, we hypothesize that seed availability will be the most important driver of regeneration, and that safe sites will be more important where there is greater seed limitation. These results will help us understand the patterns of change in larch forests in the face of climate change.

### **The queen craves calcium: micronutrient effects on litter arthropods in a coastal tallgrass prairie**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Kiersten Paige Angelos, Jesse Chapman Alexander Chapman, Kaitlin Marie Gawkins, Shania E Hurst, Ryan William Reihart

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The biogeochemistry of earth is being redistributed through various anthropogenic activities; however, the consequences of these alterations on high trophic levels remains unknown. Along the coast, for example, marine-derived nutrients are being deposited by large tropical storms, which may be increasing in intensity and frequency with climate change. These storms have the potential to deposit large amounts of micronutrients, which are less abundant in living tissue, and could affect the abundance and diversity of litter arthropods. Despite understanding how macronutrients (nitrogen and phosphorus) affect litter arthropods, the effect of micronutrients (calcium, sodium, and potassium) remains unknown. To determine how biogeochemistry affects litter arthropods, we utilized a factorial, fertilization experiment that manipulates macro- and micronutrients (N&P, Ca, K, and Na; all possible combinations: 16 treatments x 8 replicates = 128 plots) in large 30 m x 30 m plots at the University of Houston Coastal Center near Houston, TX. Pitfall traps were installed in May and July 2017 to collect litter arthropods, which were sorted and identified to the lowest possible taxon. Results show that *Nylanderia fulva*, an invasive crazy ant, was the dominant litter arthropod across all treatments, as this ant composed >95% of the entire litter community. Additionally, predatory arthropods were limited by Ca, but were suppressed by the combination of Na and K. Arthropod prey in this ecosystem were most abundant in the combination of macronutrient (N&P) and Na treatments, indicating that prey are co-limited by macronutrients and Na. These results indicate that different trophic levels, predators and prey, can be limited by different nutrients within the same ecosystem, while also giving insight as to what makes an invasive species so successful.

### **Invasional meltdown on the Texas coast? Positive interactions between an invasive plant, an invasive ant, and a non-native moth on the endangered coastal tallgrass prairie**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Emily E Jones, Emma Quill Kaufman

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Positive interactions between invasive species may facilitate and amplify the invasive success of each interacting partner, leading to "invasional meltdowns." Coastal tallgrass prairies, imperiled ecosystems along the Gulf Coast, are currently under threat by non-native species species from multiple trophic levels: the Chinese tallow tree (*Triadica sebifera* L.), the omnivorous tawny crazy ant (*Nylanderia fulva* Mayr), and most recently, an adventive, hypermetamorphic, herbivorous moth (*Caloptilia triadicae* Hodges). Previous research demonstrated that invasive Chinese tallow induces extrafloral nectar (EFN) in response to specific, chewing herbivores, and tawny crazy ants have been observed consuming tallow EFN on the prairie. However, the nature of interactions between these three species is currently unknown, and studies of tri-trophic interactions between spatially-associated, non-coevolved invasive species are underrepresented in the ecological literature. We hypothesize that invasive Chinese tallow, when attacked by the non-native moth, confers a nutritive resource to the ecologically dominant invasive ant. To determine the nature of the interactions between these species, we will experimentally manipulate EFN induction in potted Chinese tallow saplings using various levels of *Caloptilia* infestation, conduct complementary laboratory feeding trials with the ants, and measure the effect of ant exclusion on *Caloptilia* parasitism and predation on field-grown tallow trees.

### **Prairie designers: *Cambarus diogenes* as an ecosystem engineer in a coastal tall grass prairie**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Emily Katherine Brady, Shania E Hurst, Ryan William Reihart

**ADVISORS** Kathleen A Kargl, Chelse M Prather

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In a coastal tallgrass prairie, fatclaw crayfish (*Cambarus diogenes*) are an abundant, but little studied species. They burrow from the water table to the surface, carving chambers where groups of crayfish live, and assembling a soil "chimney" that they use to access the prairie. It is unknown how these crayfish that move vast amounts of soil may be affecting prairie ecosystem processes, or if soil

nutrients affect where chimneys are found. Little is also known about the diet of the fat claw crayfish or their trophic placement in a prairie food web. We determined how nutrients affect the abundance of chimneys by counting the number of chimneys in a large fertilization experiment that manipulated (N&P, Ca, K, and Na). Conversely, we also determined if crayfish affect soil characteristics by measuring total soil moisture and bulk density, total nutrient concentrations, and nutrient availability from chimneys and soils at an increasing distance away from chimneys. Using our estimates of chimney abundances, we also determined how much soil crayfish move, and how they affected soil nutrient pools and availability. Additionally, we collected crayfish claws and used stable isotopes to determine the placement of this species in the prairie food web. The abundance of crayfish was affected by soil nutrients. Plots containing a combination of N&P and Ca tended to have a higher abundance. Conversely, crayfish chimneys also affected soil characteristics: the soils from chimneys were very high in available sulfur compared to soils away from chimneys. A total of 245.76 g/m<sup>2</sup> of clayey soil was likely brought up from anaerobic conditions where sulfur-reducing bacteria are present. Available potassium was lower at the base of the chimney, and got progressively higher the further you moved from the chimney. Because *Cambarus diogenes* significantly affected available soil nutrients, they likely play an important role in structuring plant communities and nutrient cycling in these rare prairies. As ecosystem engineers, their presence may be important in coastal prairie restoration and conservation. The cycling of nutrients cause by the crayfish building chimneys could manipulating what plants are able to grow in the ecosystem, and some plants need specific nutrients to be successful. Crayfish could be the key to helping preserve the fading prairie ecosystem.

## **Inhibition and Prevention of Biofilm Growth: The Effect of a Cationic and Novel Zinc Porphyrin on *Pseudomonas aeruginosa* Biofilm Formation on Different Substrata**

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** David Anthony Rivetti

**ADVISORS** Nehaben Patel, Jayne Robinson, Karolyn Hansen

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

A biofilm is a group of microbes that are found in hydrated matrices of cells and contain polysaccharides, extracellular DNA, and proteins. Bacteria growing in biofilms are often resistant to antimicrobial treatments and are able to go undetected by the immune system of their host if located within a host organism. Microorganisms that form biofilms have the potential to colonize all higher organisms and contaminate biomedical implants, leading to further complications. As a result of their physical and chemical properties, biofilms are difficult to break down and separate from their surfaces. With the increasing problem of antibiotic resistance, there is a need to further consider different treatment options to combat biofilm growth. Cationic porphyrins have the capacity to cause DNA damage in a biofilm by intercalating between the base pairs of a DNA sequence, resulting in the breakage of the strand. Certain porphyrins can be used in the absence of light, while others require photoactivation in order to achieve their optimal effects. In order to further develop a comprehensive treatment method and identify other uses for the porphyrins, additional substrata must be tested in order to determine if porphyrins can be utilized as a viable treatment option. The substrata considered include metal (stainless steel, a biomedical implant material), polyethylene (kidney dialysis tubing material), oyster shell (an easily fouled environmental surface), and glass. TMP, or 5,10,15,20-tetrakis (1-methyl-pyridino)-21H,23H-porphine, tetra-p-tosylate salt, and a novel zinc porphyrin were introduced to the *Pseudomonas aeruginosa* biofilms on the various substrata to test for efficacy in disruption of a formed biofilm as well as inhibition of biofilm growth on the substrata. In both cases, a reduction in biofilm growth was observed following viable plate counts and confocal image analysis.

## **Synthetic aptamers as potential novel efflux pump inhibitors of the TolC channel in *E. coli* strains**

College of Arts and Sciences: Chemistry

Poster - Graduate Research

**PRESENTERS** Venicia Alhawach

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Antibiotic resistance is more than ever one of the most contemporary challenges threatening the health system worldwide. According to World Health Organization, previous cases of bacterial infections - once treatable with antibiotics - can now be lethal due to the uncontrolled misuse of these agents. The emergence of resistance to antibiotics and the dearth of novel drugs currently under development urge the need to search for new effective antibacterials. One of the main triggers of bacterial resistance is the over-expression of multi-drug resistant (MDR) efflux pumps. These pumps allow the bacterium to pump antibiotics out of the cell and therefore desensitizes the cells to the antibacterial inhibitory effect. In this project, we propose to design small chains of nucleic acids called aptamers to bind to and block the outer membrane channel of the efflux pump, which is a protein called TolC, as one effective way to impede antibiotic resistant bacteria from effluxing antibiotics. To generate the DNA aptamers exhibiting a binding specificity to *E. coli* cells, the method of a whole-cell Systemic Evolution of Ligands by Exponential Enrichment (SELEX) was applied to a random single-stranded DNA library. Whether these aptamers were able to impede the efflux activity of the *E. coli* pump was then evaluated using an in-vivo efflux assay.

## **The Impact of the 515nm Effect on Singlet Oxygen Quenching in Photosynthesis:**

## Model System Studies Using Beta–Carotene–Acid Complexes

College of Arts and Sciences: Chemistry

Poster - Honors Thesis

**PRESENTERS** Lauren Arlene Hoody, Caoqinglong Huang, Ashlee Elizabeth Wertz

**ADVISORS** Mark B Masthay

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Beta-carotene is an orange biological pigment present in green plants, where it plays a protective role against the potential harmful effects of light. beta-carotene does this by deactivating “singlet oxygen”, which is a toxic molecule generated during photosynthesis. During photosynthesis, beta-carotene temporarily converts from its native orange state to a pink state. We hypothesized that pink  $^1O_2$  reacts with singlet oxygen less efficiently than native orange beta-carotene. To test this hypothesis, we chemically modeled beta-carotene's pink state with blue beta-carotene–acid complexes, which are chemically similar to pink beta-carotene, created by reacting beta-carotene with trichloroacetic acid (TCA). beta-carotene's efficiency at deactivating singlet oxygen was characterized by measuring the rate of degradation of 1,3-diphenylisobenzofuran (DPBF), which has a high reactivity towards singlet oxygen and is used to detect the amount of singlet oxygen in a solution. Our DPBF–based results to date indicate that native orange beta-carotene and blue beta-carotene–TCA complexes quench singlet oxygen with roughly equal efficiency. In future studies, we intend to confirm our DPBF–based results by monitoring the impact of beta-carotene and beta-carotene–TCA complexes on the 1270 nm (near–infrared) emission of singlet oxygen using a state–of–the–art, time–resolved near–infrared spectrometer; the UD Chemistry Department hopes to purchase this instrument in the near future. The results from this research could facilitate the development of solar energy devices with greater long-term stability.

## The Impact of External Stimuli on the Molecular Trajectory of Micelles Residing at the Stability Boundary

College of Arts and Sciences: Chemistry

Poster - Course Project, 201810 CHM 304L 01

**PRESENTERS** Joshua Killian, Jiayi Xie

**ADVISORS** Yoon S Lee

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Self-assembly is the potential key to understanding how we can build useful chemical and biochemical systems from individual molecules up to macro structures. The modification of the makeup of a micellar solution and observation of some of the physical and chemical properties of the solution was the goal and purpose of this research. Specifically, the purpose was to determine the molecular trajectory of the formation of the micelles in solution and to attempt to explain different kinetic and thermodynamic pathways. This research explored the nature of surfactant micellar solutions that contained a headgroup of ammonium with a chloride counter-ion in three different tail-group compositions. The three solutions were cetyltrimethylammonium chloride, tetradecyltrimethylammonium chloride, and dodecyltrimethylammonium chloride. The solutions were modified by the addition of various species, most significantly, decyl alcohol, tetraethylorthosilicate, and benzene. They were subject to heating, cooling, and shaking to form different micelles. The solutions were tested by various methods, including IR runs and particle size analysis, of the clear, shaken cloudy, and temperature manipulated cloudy states. The results of this research showed that there were two pathways of micellar composition, a kinetic and a thermodynamic pathway. Future research could involve the further modifying the makeup of different micellar solutions by the addition of different types of alcohols, aromatic compounds, or silicate groups to determine if these trends are consistent across different micelle formations.

## The Impact of Benzene as a Chaotropic Agent in Surfactant Based Multicomponent Self-Assembling Systems

College of Arts and Sciences: Chemistry

Poster - Course Project, 201810 CHM 304L 01

**PRESENTERS** Sean Ernest Cedeno, Kasia Maria Solomianko

**ADVISORS** Yoon S Lee

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Self-assembly is a fascinating field that provides endless possibilities for chemical manipulation. This experiment investigates what effect benzene has during the self-assembly of micelles in various carbon chain solutions. Upon omission of delivering benzene from the solution, the system displayed the formation of an irreversible liquid crystal relatively quickly. IR spectroscopy was performed on one solution with benzene and one solution without benzene to try to understand what kind of role benzene plays within the system. Upon examination of the IR spectra, there was a clear difference in IR peaks. It was theorized that benzene has some sort of interaction with the tetraethyl orthosilicate (TEOS) that allows the system to form micelles that can reverse when left alone. Future experiments may include investigating the effect of water on the system as well as the effect of stirring on the system.

## A New Method in Organophosphate Synthesis

College of Arts and Sciences: Chemistry

Poster - Independent Research

**PRESENTERS** Emily Kathryn Granger, Kasia Maria Solomianko

**ADVISORS** Jeremy M Erb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

A variety of nucleophilic and Lewis acid catalysts were examined for use in promoting the synthesis of organophosphate triesters. All 8 organophosphate triesters are new compounds, reported here for the first time. MgSO<sub>4</sub> was discovered as an inexpensive catalyst capable of improving the synthesis of a variety of aryl organophosphate triesters from the readily available and low cost precursor phosphorus oxychloride in a three-step, two-pot sequence. Yields for this method improve upon the uncatalyzed method by 8-36%. Although several chiral catalysts were tested, none were able to induce enantioselectivity in the reaction.

## Unrecognized and Underwritten: The History of the Black Press

College of Arts and Sciences: Communication

Poster - Course Project, 201780 CMM 439 01

**PRESENTERS** Jada Monique Woods

**ADVISORS** Chad E Painter

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The black press was born out of a need and that need is still pertinent today. Before 1827, black people largely did not exist in the media. There were only two options for the black community stay silent and keep their marginalized voices to themselves or start voicing those opinions and advocating for rights by creating a newspaper. After 1827, black newspapers in the North developed into the main medium of expression and primary community service outlet for black people. The researcher examined the history of black media from the mid-1800s to 2017. Evidence from black newspapers and publications throughout history shows every success against oppression and inequality has come with a price for black press in the United States. In 2017, blacks have more opportunities because of those publishers whose goal was to elevate and educate blacks. Currently, blacks have improved the second-class citizen status in some respects, but clear inequalities still persist. Although mainstream news organizations have made efforts to represent blacks more, there are still large disparities. The black media is still essential for the well-being of the black community. The black press began as an outlet to acknowledge the black community and push for equality and this kind of activism is still needed today.

## Public Memory: The Monuments and Memorials of UD

College of Arts and Sciences: Communication

Poster - Course Project, 201810 SSC 200 31

**PRESENTERS** Jen Mayrena Agudelo, Essa Alhamer, Lillian Margaret Dickman, Andrew Patrick Gross, John Martin Harmon, Brandon Michael Heath, Leah S Henkel, Seth Christian Hill, Kristen Hisek, Mitchell Christopher Honious, Tyler Andrew Johnson, Trent E Jones, Kelly Ann Katis, Kristine Anne Kearney, Liza Christine Lutz, Taylour W McMullen, Katie Katherine Parker, Matthew John Pins, Ryan Darnell Scott, Cassandra L Secrease, Micheal John Sheridan, Sophia Jane Tokar, Marcel J Tworek, Ying Wang, Adam Steven Wicks, Joseph J Wilson

**ADVISORS** Cassandra L Secrease

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Public Memory themed section of SSC200 was tasked with proposing monuments and/or memorials needed on campus at The University of Dayton. Five groups of five students each conducted survey, observational, and archival research to choose subjects connected to the UD culture and deemed worthy of commemoration. Through careful consideration of concerns related to public memory, identity, culture, and materiality, each group created and designed either a monument or memorial fitting the memory of their chosen subject. Groups will be able to explain their designs, rationale, and processes culminating in their final Course Project for SSC200.

## Opportunities for Improvement of University of Dayton Resources Regarding Anxiety and Depression

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Emily Cecilia Goecke, Kayla Christine McCarthy, Molly Alison Murray, Rachel Ann Pavlinec

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The problem of anxiety for college students is steadily increasing. And, in recent years, anxiety has passed depression as the number one health issue specifically targeting women. Due to the stress of a changing lifestyle, college students and young adults are most affected by anxiety. If not treated, anxiety can be detrimental to sleep patterns, academic performance, and overall health. The University of Dayton provides a counseling center and some other resources for students to help cope with anxiety. However, after evaluating these resources, we found them in need of improvement. After comparing UD's resources to those available at other college campuses and speaking with fellow UD students, we determined that access to online resources may be more beneficial than traditional mediums to help treat anxiety. Because anxiety affects such a large population of college students, there are several ways to give students access to the help they need. By providing greater awareness, using technology in the form of mobile applications, and giving students 24/7 access to support, the overall mental health of college students at UD could improve. We have also created

a document to inform students about the facts and opportunities for persons suffering from anxiety and depression at UD.

### **Improving Access to Test Anxiety Information at the University of Dayton**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Molly Kathleen Bush, Maddi Elizabeth Conway, Joseph Cole Emery, Kaylin Ann Kultgen

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Test anxiety is a major health problem on college campuses, affecting nearly 22% of all students, according to the College Student Health Association. The resources that the University of Dayton offers to students about test anxiety were reviewed for the effectiveness of their advertising methods. From these resources, we found that there is room for improvement in access and advertisement of information. Students from freshman through senior as well as adults and professors were interviewed for their opinions and experience with test anxiety. Resources for test anxiety at other universities were compiled and used as inspiration for ideas to improve resources for test anxiety at UD. An improved brochure was created which includes symptoms of test anxiety and tips to overcome it as well as to inform students about resources at Counseling Center and the Office of Learning Resources for students.

### **Got Sleep: An investigation of the sleep problem on Dayton's campus**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Nathaniel Dale Brown, Lucas William Edwards, Sara M Huber, Katie Rachel Knezevich

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Sleep deprivation has adverse effects on college students impacting their diet, memory, mood, focus, immune system, and overall health. The college lifestyle creates an environment that does not support adequate sleep. We talked with UD students to gauge their knowledge of the importance of sleep in a healthy lifestyle, and found most students are not aware of the effects that poor sleep creates in their lives. We believe the University of Dayton does not have adequate educational information regarding the importance of sleep. After evaluating the resources provided by other universities, we determined more can be done at UD to raise awareness of the pros and cons of sleep as well as other recommendations to get a better nights sleep. Our poster will describe our team's recommendation for raising awareness of this issue. We also created a document to provide a way for students to self-assess how healthy their sleeping patterns are as well as information on health issues related to sleep deprivation.

### **Improving Resources and Awareness for Sexual Assault at UD**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Bethany Joy Driggers, Danny Patrick Holtz, Sydney Michele Knobel, Jack H Lundy

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a growing epidemic of sexual assault on college campuses across the United States. In light of recent events in the media, it has become clear that time is up on ignoring the signs of sexual abuse. While this time is about empowering the victims, it is also about recognizing the detrimental effects that sexual assault can have on a college-age individual. Today, the University of Dayton has numerous campaigns in which they inform the community on sexual assault and the resources available. However, after further research and investigation, it has become clear that UD could offer more resources for students to utilize to get help. UD offers students numerous resources, both on and off campus for students to utilize. That being said, only two of these resources are available to students on a 24/7 basis. We then looked beyond UD and researched the various resources available on other college campuses. Some of the resources we found when looking in the area included student legal services, The Women's Place, The Student Advocacy Center, the Sexual Civility and Empowerment Program (SCE), and a 24 hour crisis hotline for students to call in case of an emergency. Due to a lack of information shared and posted across campus, and the lack of resources available to victims on weekends, our group has decided to recommend how UD can become a more proactive and safe place for victims to get help and share their stories.

### **Strengthening Resources about Sexual Violence at UD**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Luke Alan Bressler, Elizabeth Ann Edurese, Shalom Shekinah-Arpita Reuben, Leah Ann Schneider

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Sexual violence is prevalent on college campuses across the nation. The University of Dayton has made attempts to combat this issue. The university offers resources such as counseling services, online modules, Green Dot, and advice for dealing with sexual violence on their website. Although UD seems to have an abundance of resources, an issue arises in the school's ability to spread



awareness of these resources to the students. This is realized through interviews we conducted with fellow students who were largely unaware of all that the school has to offer. In response to this lack of awareness, we will provide recommendations for future ways to support victims of sexual violence as well as to reduce the number of cases each year. This past year there were 16 reported cases of sexual violence, and for the small size of our campus, this is a concerning frequency. We believe that by providing access to the school's sexual violence resources in high-traffic areas, students will become more aware of the problem and be able to easily access the information when needed. In addition to making recommendations for information more accessible, we created a document with updated information that is more specific to UD's students.

## The University of Dayton's Current Amnesty Policy and its Ramifications for Students

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Samantha Marie Achauer, Samantha Kaye Isidro, Maddie Ann Sauer

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Although universities work to provide the best environment for student health and safety, ultimately it falls on the student to be responsible for alcohol consumption. Some universities have included an amnesty policy in an effort to prioritize the health of the students over the consequences of drinking. An amnesty policy typically states that students who seek medical assistance for themselves or for others will not be subjected to University disciplinary action for violation of alcohol policies. By removing the fear of punishment, students will be more likely to report alcohol-related incidents for themselves or other students. The University of Dayton (UD) has recently changed their amnesty policy to foster a more open dialogue between students and administration regarding alcohol. However, many UD students are unaware of these changes. After interviewing several UD students, it has been established that students knowledge of UD's policies and practices surrounding alcohol and substance abuse are relatively unknown. UD's website, resources, and transparency were compared with other universities, and we cross-compared this with rates of alcohol write-ups at the different universities. This project hopes to establish a better protocol to make students aware of the resources UD has available, as well as the main mechanism of action surrounding alcohol write-ups. In an effort to educate the campus further, we have created a document highlighting and simplifying the University's amnesty policy and the associated disciplinary and educational process for alcohol-related infractions.

## Handling Homesickness: Helping Transitioning First-Year Students at the University of Dayton Recognize and Cope with Homesickness

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Kennedy Glynn Hale, Wyatt Andrew Kaiser, Ali M Wieth

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

According to Academia, "Up to 95% of first-year college students report some level of homesickness." The transition to college can be the biggest change many first-year students have ever dealt with. Quickly, they may begin to long for home and become homesick. With this in mind, we researched the issue of homesickness and the resources on the University of Dayton's campus and other college campuses. At the University of Dayton, the issue of homesickness is briefly mentioned on the counseling center's website. There seems to be a lack of resources and attention on our campus to this topic, which affects almost all incoming freshman at one point in time. To investigate how homesickness affects first-year students, we interviewed current freshmen to evaluate their personal experience with these issues and how they overcame their discomfort. In addition, interviews were conducted with resident assistants on their training for these issues and how they help students become acclimated to college. Through researching other universities across the country and interviewing the community on our campus, we have created multiple suggestions for supporting freshmen during this time of change. Our goal is to provide resources dedicated to help first-year students experiencing homesickness by increasing their overall happiness on campus while also helping them become successful in their future endeavors.

## Improvement on Healthy Views of Body Image at UD

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Daniel Joseph Link, Jessie Leigh McLaughlin, Christopher James Turley, Emily Elisabeth Wey

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The National Eating Disorders Collaboration describes body image as "the perception that a person has of his/her physical self... [and] the thoughts and feelings the person experiences as a result of that perception." Body image can be a lifelong stress and one that is especially heightened in the college years and environment. Unhealthy misperceptions of body image can lead to many dangerous consequences such as eating disorders, depression, and anxiety. Focusing on pressures such as social media and preparing for Dayton to Daytona, we sought to develop resources for UD to support individuals who struggle with an unhealthy body image. We analyzed publications produced by the Health and Counseling Centers and found that there are few resources available to students struggling with poor body images and eating disorders. Furthermore, we have found that many of the available resources

are outdated, nonspecific, and poorly advertised. Pamphlets and counselors are the most noticeable resources available to these students. Resources from other Universities were explored to brainstorm ideas in which UD might improve the resources provided to students. Our goal is to improve several aspects of body image at UD, specifically creating awareness and giving resources to students who have issues with body image on campus. We want to uphold UD's values of being an inclusive community for all by creating materials for the university that promote the acceptance of all body types.

### **The Search for Support: Pregnancy on Campus**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 01

**PRESENTERS** Sara Kathryn Brothers, Maddie Kay Gerdes, Elizabeth Anne Goetz, Chase Alan Sawyer, Diandra A Walker

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

At the University of Dayton, pregnancy is not a prevalent topic of discussion among undergraduate students. Recent research indicates that single mothers are less likely to receive a college degree when compared to women who are single without children or married. In addition, the number of single mothers who are undergraduate students has more than doubled since 2000. Our group investigated how prevalent pregnancy is on college campuses, and found more about the resources provided by UD. Although there are some on-campus resources, like the Women's Center and the Hand in Hand Program, there is a lack of awareness about what types of services these organizations provide. We concluded that the University should make resources more accessible for students who are pregnant or already parents. The goal of this poster is to raise awareness about what resources are available and make recommendations for improving accessibility to information on those resources. Our group will also provide a brochure, which will incorporate relevant and updated information, specifically for UD students. Our hope is that students will become more aware of what is available and feel more comfortable reaching out to utilize these services.

### **Recommendations for Improving Eating Disorder Services at the University of Dayton**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 373 H1

**PRESENTERS** Sarah Elizabeth Kane, Maria Pasqualina LaBello, Corteney K Miller, Austin Michael Mueller

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Eating disorders are most common among students 18-21 years of age and are becoming increasingly prevalent on college campuses. When no longer under the eye of family and close friends, a college student can develop an eating disorder without anyone noticing. According to the National Eating Disorder Association, 35% of all college student dieters progress to pathological dieting, and 20-25% of these students subsequently develop a full-blown eating disorder. While the University of Dayton offers health brochures and professional help through the Counseling Center, Health Center, and Campus Ministry, we believe their resources could be improved to better reach the intended population. The University of Dayton does not offer easily accessible information that specifically targets their students, nor extends their resources beyond having a student consult a professional such as a dietician, doctor, counselor, or a campus minister. While these opportunities can be effective, they should be supplemented with other resources; especially considering that many students consult help off campus to cope with eating disorders. More information should particularly be supplied on how roommates, resident advisors, friends, and other peers on campus can recognize the most common eating disorders including, anorexia nervosa, bulimia nervosa, and binge eating/compulsive overeating. Therefore, the purpose of our research project is to examine the University of Dayton's existing programs, and how other colleges have approached eating disorders on their campuses. As a result, we will use this information to develop a document that effectively addresses possible recommendations on the University of Dayton's campus.

### **Disparities in Health Literacy Examined Through Diabetes Mellitus Resources**

College of Arts and Sciences: English

Poster - Course Project, 201780 ENG 366 01

**PRESENTERS** Tessa Louise Farthing, Noha Jan, Taylor Nicole Vernot

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

When an individual has a low health literacy level, their ability to successfully access and comprehend healthcare procedures and treatments is impaired. This resulting healthcare disparity is especially prevalent among individuals that speak English as a second language. Our team conducted a Health Literacy Load Test using the multidimensional model and a SMOG test in order to analyze the literacy of an existing Diabetes Mellitus resource published on MedicineNet.com. The goal for our team's project was to revise the website's content in order to accommodate the English health literacy levels of individuals enrolled in the University of Dayton's Intensive English Program (IEP). The original documents were found to be written at approximately a 12.4 grade level. The revised informational brochure that our team created was concluded to be around a 5th grade literacy level.

## **Electronic communication and social media in organizations**

## College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 372 09

**PRESENTERS** Shuo Du, Patrick Flynn Duggan, Micaela H Foley, James M Gates, Michael Dean Glaser, Katie Elizabeth Hathaway, Cameron Michael Hendershot, Daniel Patrick Kelly Jennrich, David Philip Kelley, Tillie Jean Kummerer, Carl J Leggett, Xiaoli Li, Kevin James Lynch, Mario Mathew Manta, Heather Elizabeth May, Ashley Elizabeth Mercks, Stephanie Adele Moline, P.J. Anthony Randazzo, Jack William Reilley, Jack D Schafer, Robert Conway Smyjunas, Xuanheng Wang, Conor Patrick Wood

**ADVISORS** Xiaoli Li

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Students in ENG 372 Business & Professional Writing classes participated in a virtual business professional project that involves almost 600 students in 96 teams from 14 universities in 7 countries. All teams were asked to identify an organization that has a robust online presence, such as a web page, Facebook page, Twitter feed, customer blog, and so on. Then the team analyzed the quality of these mechanisms in terms of building and maintaining the organization's reputation. They identified major conclusions about this company's online presence. Finally they wrote a report that introduces the organization and its online communication tools, provides an analysis of its online presence, and offers recommendations for improvements. They evaluated the company's reputation (built in or bolted on) and provided evidence for their conclusions. The report identified whether the organization is conveying its core values through its social media use and provide recommendations how the company can improve its online presence that address each of the conclusions. This project emphasizes the development of critical-thinking, cross-cultural communication in global contexts, and virtual collaboration and team-building skills.

## Semester of Service at Aullwood Audubon: Ewe, Me, and Energy

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Thomas Brewster Tappel

**ADVISORS** Craig James Attenweiler, Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This semester, my last semester, I worked full-time at Aullwood Audubon as their (in way over my head) energy engineer. During my time at Aullwood, I coordinated projects aimed at reducing the amount energy used at the Nature Center as well as developing plans for renewable energy generation and energy education. I also participated in some of Aullwood's programs and events exploring the trails throughout the 200-acre nature sanctuary, experiencing how to make maple syrup, and learning more than I could ever imagine about birds.

## Semester of Service - Volunteers of America Residential Re-Entry

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Independent Research

**PRESENTERS** Nathan Joseph Roman

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Through UD's Semester of Service program, I spent my last semester working full-time at the Volunteers of (VOA) America Residential Re-Entry facility in Dayton. This facility houses 130 clients who are transitioning from the criminal justice system back into society, and offers a number of programs to make this transition easier. At VOA, I assisted with employment readiness services (creating resumes and preparing for interviews), structured activities (life skills and recreational time), and also helped to connect clients to appropriate resources in the community.

## Semester of Service at Daybreak

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Emma O'Neill Bertrand

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

I have dedicated this semester to service for the Dayton community. Specifically, I am working with Daybreak youth homeless shelter. As a communication major, I have a gift for telling stories both written and visually. I will use these skills throughout the course of the semester to tell the stories of the people at Daybreak and to bring about awareness of the agency and all of the good that it does.

## Semester of Service at Adventure Central

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Caroline Marie Shepherd

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Adventure Central is an after school program that encourages environmental education and appreciation. Through the Semester of Service program at UD, two group leaders were hired to work full time at Adventure Central. Semester of Service participants are acquiring experience in lesson planning and educating elementary aged school children. Adventure Central is located in West Dayton and caters to Dayton City School students. There is no where else in the country that rivals Adventure Central's success in after school programming. Adventure Central is possible through partnerships with Five Rivers Metroparks, The Ohio State University and 4-H. Semester of Service participants have their own classroom to maintain and plan for. Students at Adventure Central range from six to 18 years old. Adventure Central promotes positive youth development in the West Dayton community.

### **Semester of Service - Adventure Central**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Ellie Marie Ryan

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Adventure Central is an after-school program that focuses on positive youth development, health and wellness, and interaction with science and nature. Adventure Central assists students with any homework or school assistance needed as well as provides structured activities for after school hours. Adventure Central is a partnership between The Ohio State University, 4-H Youth Development, and 5 Rivers Metroparks of Dayton. It is located in the West Dayton community and continues to improve the lives of the students and the families it serves. This semester, as part of the Semester of Service Program, I am working at Adventure Central as a Group Leader. I am working on lesson and activity planning for a small group of students. By working in the West Dayton area, I am allowed the opportunity to immerse myself in the community.

### **Semester of Service at the Brunner Literacy Center**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Fiona Marie Madden

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Through UD's Semester of Service program, I worked at the Brunner Literacy Center. The center began serving illiterate and low-literate adults in the Dayton area in 2006, and has since expanded its services to include GED prep and English as a Second Language (ESL) tutoring. I worked to further the BLC's mission of providing a safe, welcoming place for adults to learn by acting as a program assistant and tutoring students from Dayton, Sudan, and the Dominican Republic.

### **Semester of Service at Homefull: Housing First and Homelessness in Dayton**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Alexandra M Altomare

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homefull is a non-profit agency that provides case management services to the homeless population in Dayton to help individuals escape homelessness hopefully into a stable and long-lasting independent living situation. With a housing first philosophy, Homefull casemanagement is focused on getting clients out of shelter as a top priority, with all other services to follow. As a case manager this semester, I assist clients in getting linked with services to manage their mental health conditions, stabilize alcohol and drug abuse, and find income to prepare clients for the housing opportunities Homefull is able to assist them with. The role of the case manager ranges from advocate to potential landlords, sympathetic ear to a hard day, or stern motivator to encourage clients to seek help for themselves. But no matter the task that day, the end goal is always to find a reconciliation between the poverty and lack of affordable housing in Dayton to break the cycle of neglect towards this vulnerable population.

### **Semester of Service at Homefull**

College of Arts and Sciences: Fitz Center for Leadership in Community

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Krishna Sai Phaneendar Mullapudi

**ADVISORS** Castel V Sweet

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homefull, formerly The Other Place, was founded in 1988 in Dayton, Ohio and has grown to meet the challenging needs of the community in service to homeless persons. Through UD's Semester of Service Program, this semester I have volunteered to work for

Homefull as an IT intern. During my time at Homefull, I have assisted the employees with their every day tech needs and trouble-shooting their issues with computers. As a Computer Science major, I have dedicated my time here shadowing different employees and made suggestions to make their work easier. I am also working on building an interface to quickly and efficiently search through different organizations such as food Pantries that will help our clients. I have had a chance to travel across different sites that Homefull serves and learn more about American society by meeting different people. It has been only one year for me in the USA and I am thankful to SOS that I was able to learn many things through this program, that my four walls classroom would have never taught me.

## **Water: More Than Just a Life Source for Ethiopian Women and Children**

College of Arts and Sciences: Geology

Poster - Course Project, 201810 GEO 208 01

**PRESENTERS** Alyssa Marie Miller

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Water is a basic human right that we, as Americans, tend to take for granted. Many of us do not know the full extent of how water is unequally distributed in some areas of the world, specifically in developing countries. The objective of my research is to examine the effect of the lack of clean water in sub-Saharan Africa in general and Ethiopia, specifically on women and children. Ironically, Ethiopia is considered as a water tower of Africa and a source of the Blue Nile River, but 32% of the population do not have access to clean water. Studies indicate that the unprecedented effect of climate change on hydrologic cycle will significantly affect the availability of water in the region. Per the Huffington Post, Ethiopian women and children in some rural areas walk up to four hours a day to fetch even non-sanitized water, which cause waterborne diseases that claim the lives of 500,000 children. This lack of access to clean drinking water has placed a burden on females and children and risk their safety by embarking on this long journey, which also loses their opportunity to attain an education. Here, I will gather data on distribution of water resources, population, socio-economic and public health from different sources (i.e, publisher articles and United Nation reports), and analyze the severity of the problem. Further, I will consider the potential effect of the country's plans to build the "Grand Ethiopian Renaissance Dam" to improve the livelihood of women and children. Finally, I will observe if there are any policies considered being passed to improve water accessibility, which would impact women and children's well-being and could lead to an education to better develop the nation.

## **Wetland Dynamics and Potential Applications within the Great Miami River Watershed to Address Elevated Levels of Agriculturally-Derived Nitrates**

College of Arts and Sciences: Geology

Poster - Course Project, 201810 GEO 208 01

**PRESENTERS** Matt Stephen Jones, Alex Robert Paschal

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Changes in agricultural practices in the Mississippi River Basin, especially high-density row crop farming and increased fertilizer usage, affect the overall total of loose, agriculturally-derived nitrates that flow through defined watersheds. Wetlands, on this note, function as filters for such water-soluble compounds like nitrates through physical mechanisms (sorption, sedimentation, and volatilization), chemical mechanisms (transformation and precipitation), and the biological mechanism of plant uptake. Thus, wetland subsections serve a vital role in watershed dynamics by removing nitrates from the macroscopic fluid-flow through the system. However, in numerous watershed-scale studies, expected empirical effects of wetlands have not been numerically realized. This is potentially due to the destructive interference between the nitrate removal effects of wetlands and the nitrate additive effects of increased crop coverage in studied regions. Thus, a study was designed and executed to isolate the effects of each of these mechanisms and compare the effectiveness of wetlands with other nitrate removal techniques; resulting from this study, it was shown that, per unit area, wetlands are five times more efficient at reducing water-soluble nitrate concentrations than the most effective land-based nitrogen removal strategies. A similar study in the Great Miami River Watershed, where more than 40% of streams do not meet Ohio's water quality standards, is vital to improve water quality and nutrient management and. Here we will use water quality data, land use and drainage maps to suggest potential wetland locations in the Great Miami River watershed that would alleviate the problem of elevated levels of agriculturally-derived nitrates within the region.

## **GLOF Modeling of Hongu Glacier Lake in the Nepal Himalayas: A GIS-based Approach**

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Katherine A Strattman

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The objective of this project is to model a glacial lake outburst flood (GLOF) of Hongu Glacier Lake, located in the Mount Everest region of Nepal, using a physically-based GIS model. Due to recent climate change many glaciers in the Himalayas have experienced rapid retreat, resulting in the development and growth of proglacial lakes. Often dammed by terminal moraines composed of unstable and unconsolidated material, trigger events such as excessive rainfall or avalanches can cause the dam to be breached,

releasing massive amounts of water over a short period. Large volumes of water combined with the steep and complex terrain of the Himalayas causes serious threat to downstream populations and infrastructure. Assessing and monitoring proglacial lakes using remotely sensed images has become a widely established practice as many glaciers, including Hongu, are in unreachable, remote area. Additionally, GIS-based flood models allow for spatial analysis of risk assessment. Using digital elevation models (DEMs) derived from remotely sensed images, land cover data, and soil data as base maps, the freely available WetSpa model is applied to Hongu Glacier Lake for flood prediction. WetSpa, or Water and Energy Transfer between Soil, Plants and Atmosphere, is a physically based GIS model that simulates hydrologic processes continuously over time and space on the catchment scale. DEMs from 2015 imagery are obtained freely through NASA's Earth Explorer program, and soil and land use data are obtained from the International Centre for Integrated Mountain Development (ICIMOD). Outputs in the form of hydrographs from the WetSpa model are imported into ArcMap for analysis. Information on extent and intensity of the modeled GLOF can be used for risk assessment or future planning of infrastructure.

### **A stable isotope approach to nitrate contaminant tracing in the Great Miami River Watershed**

College of Arts and Sciences: Geology

Poster - Independent Research

**PRESENTERS** Rachel Kristine Buzeta

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The global population has been increasing exponentially and has caused several challenges surrounding sustainability, including the need for greater food production. To meet these demands and boost agricultural productivity, mechanized, more efficient agricultural practices and chemical fertilizers are used. These chemicals have resulted in water pollution and water quality degradation. Much of the Great Miami River Watershed's streams and aquifers are impacted by excessive amounts of nutrients such as nitrate originating from anthropogenic sources including use of fertilizers for agriculture, human wastes (domestic, industrial, and municipal wastes), and urbanization. High nitrate concentrations can cause ecological disturbances and affect organisms across all trophic levels. It also poses a danger to human health (nitrate levels greater than 10 mg/l) if the contaminant reaches drinking water sources. Although a network of water quality monitoring stations report nitrate concentrations in surface and groundwater, contaminant source tracing has not been done. Here we used isotope fingerprinting techniques to trace sources of nitrates. Isotopes of nitrogen ( $^{15}\text{N}$ ) and oxygen ( $^{18}\text{O}$ ) are used to identify unique nitrate isotopic signature from different sources. Our results show distinct  $^{15}\text{N}$  and  $^{18}\text{O}$  isotopic signatures from different land use and sources such as agriculture, septic systems, and animal waste. Further analysis of boron isotopes ( $^{11}\text{B}$ ) is used to distinguish anthropogenic sources (synthetic fertilizer, wastewater) from natural sources (organic fertilizer). Preliminary data has shown that different nitrate sources have different ranges of  $^{15}\text{N}$ ,  $^{18}\text{O}$ , and  $^{11}\text{B}$  values. The collective data from our first-round of sampling suggests that the isotopic composition of these sources can be used to quantify contaminants in groundwater that comes from those sources. The outcome of this research could provide a regional baseline for nitrate contaminant tracing and help to inform state and local water quality management and public health policies related to nitrate resources.

### **Revising the Geological Time Scale: A Multi-Clade CONOPg Composite from the Middle Ordovician Rocks of Newfoundland**

College of Arts and Sciences: Geology

Poster - Honors Thesis

**PRESENTERS** Katherine Gayle Michel

**ADVISORS** Daniel Goldman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Geological Time Scale is a fundamental tool for geoscientists that is revised and republished every eight years. It is a representation of the geologic record - a system composed of radioisotope dates interpolated into fossil successions that can be used to correlate rocks, used a standard to which local successions can be compared, and as a framework for the rate calculations needed in geologic and evolutionary studies. The current Geologic Time Scale for the Ordovician Period (GTS 2012) is composed of a sequence of species ranges from a group of fossils called graptolites with interpolated radiometric dates. Building a global geologic time scale requires correlating between different biofacies. These correlations are difficult because the fossil organisms used to demonstrate time equivalency may live in non-overlapping environments, as well as other biases inherent in the fossil record. In this thesis I will attempt to combine stratigraphic range data from different kinds of Ordovician fossils in order to improve the precision and usefulness of the Ordovician time scale. I will integrate the range data from graptolites (deep water biofacies), chitnozoans and conodonts (shallow water biofacies) in the Middle Ordovician rocks of Newfoundland. I will conduct field studies to make new, detailed fossil collections and use these in conjunction with already published literature. In particular I will look for unusual co-occurrences of both types of fossils on single bedding planes, which have been reported in the geologic literature from Newfoundland. I plan to use the computer-assisted graphic correlation program CONOPg to create composite taxon ranges from many localities based on the first and last appearance data for each species and then construct a more precise correlation network between sections that represent disparate biofacies. This correlation network can be used in the revision of the Ordovician Time Scale for 2020.

### **The comparison of FD and RBFs collocation methods for the solution of the heat equation**

## College of Arts and Sciences: Mathematics

Poster - Graduate Research

**PRESENTERS** Lijun Lin

**ADVISORS** Muhammad Usman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The heat equation is widely used in various fields such as in industry and medicine for thermal treatment of the tumor. In this work, we are going to use two different numerical methods to solve the heat equation. It is known that Finite Difference (FD) and Radial Basis Functions (RBFs) collocation methods are both trustworthy for solving heat equation. To show the difference between the two methods, we would like to display the comparison by the final results, the error between approximate solution and exact solution, and other parameters in those methods.

## Finding the probability of being selected an NBA All-Star

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Matthew Paul Forte

**ADVISORS** Peter W Hovey

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Halfway through the National Basketball Association, there is an All-Star break where the 24 best players are selected to participate in an All-Star game. Being selected as an all-star has many implications for the player and his organization, including salary bonuses and legacy concerns. This project aims to identify the probability that players in the National Basketball Association will be selected as an all-star. The model uses a number of statistical indicators including points per game, assists per game, rebounds per game, efficiency ratings, and more.

## Minimal perimeters of triangles with fixed area and foot

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Hang Luo

**ADVISORS** Jonathan H Brown

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Triangle with the same area can have different perimeters. In this project we are exploring the question of when those perimeters are as small as possible. With no further conditions, the answer to this question is known: the minimal perimeter is obtained by an equilateral triangle. We can explore the question under the condition that location of the height is fixed. In this case the minimal perimeter can be obtained by variety of different triangle types. We want to know which type of a triangle has minimal perimeter based on the location of the height.

## A Business Application of Markov Chains

College of Arts and Sciences: Mathematics

Poster - Capstone Project

**PRESENTERS** Emily Lynn Seals

**ADVISORS** Muhammad N Islam

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The purpose of this project is to look at the economic applications of Markov Chains and stochastic matrices in a real-world problem. For this project, I studied a specific case for a rental car company which has a fleet of vehicles for rent in a number of locations. It is very important for the company to know the number of vehicles that will be available on a typical day at each location. This project will show that, on a typical day, the number of available vehicles at the various locations can be known by calculating what is called the steady-state vector of the stochastic matrix associated with the problem. This will help the company to better manage the customer demands. It can then be used to meet any increased demand at a particular location which can occur due to various reasons.

## Unique Approaches to the Finite Difference Method

College of Arts and Sciences: Mathematics

Poster - Honors Thesis

**PRESENTERS** William Thomas Shovelton

**ADVISORS** Muhammad Usman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The oldest and most useful technique to approximate the solution of differential equations is the finite difference method (FDM). This technique allows for derivatives to be replaced by the finite difference discrete approximation, hence we get a finite difference equation (FDE). As with all numerical solutions, this method is only an approximation and there will be errors due to rounding and

discretization. Over the years, new approaches to the FDM have been derived to improve the stability of the numerical solutions. These unique approaches are referred to as nonstandard finite difference methods (NFDM). The focus of this project will be to determine the effectiveness of two different NFDM proposed for an autonomous dynamical system and a class of reaction-diffusion equations. Effectiveness will be based on the accuracy to the exact solution and stability.

### **Group Songwriting as a Self-Care Practice Among College Students**

College of Arts and Sciences: Music

Poster - Independent Research

**PRESENTERS** Victoria Clare Obermeier, Emily Rose Robinson

**ADVISORS** Susan C Gardstrom

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The present study explores how group songwriting may positively contribute to self-care in the University of Dayton student community, as well as among the music therapy community. College is a time of intense stress and anxiety; thus, self-care is essential in order to maintain both physical and mental health, as well as overall functioning. Our research shows that university mental health services are highly underutilized. Some of the aims of this study are to increase visibility of self-care practices and to provide students with the additional self-care tool of songwriting, all in efforts to de-stigmatize mental illness.

### **The Stigma of Homelessness as an Identity - Homelessness as a Gendered Condition**

College of Arts and Sciences: Philosophy

Poster - Honors Thesis

**PRESENTERS** Jamie Anne Vieson

**ADVISORS** Denise D James

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The main goal of my thesis is to articulate the problem of homelessness. In order to do this, I examine philosopher Eva Kittay's work on disability and equality. Throughout her work, Kittay uses the terms human interconnectedness, oppression and citizenship. These three terms serve as the major concepts I explore. Human interconnectedness highlights the links that humans share with one another as interdependent beings. Sharing these connections provides grounding for why care needs to be available for individuals and groups. Oppression is the term used to describe how certain individuals or groups in society are treated unequally or are rejected from society. I argue that individuals experiencing homelessness should be classified as a group because they do experience structural oppression in the form of marginalization. Finally, exploration of citizenship shows the importance of identities in society and how they allow or prevent equality. Rethinking citizenship combats oppression of the homeless. More emphasis needs to be put on these terms to articulate the problem of homelessness. Within each of these terms, I look more closely at notions of dependency, vulnerability, connection-based equality, self-perceptions, and moral responsibilities. These considerations use gender as a lens for an inclusive examination of homelessness. This lens reveals how women experiencing homelessness are particularly disadvantaged by stigmas.

### **Implementation of Passive Solar Energy and Reclaimed Heat from Manure Decomposition for Livestock Water-heating Applications**

College of Arts and Sciences: Physics

Poster - Honors Thesis

**PRESENTERS** Naomi Elizabeth Schalle

**ADVISORS** Robert J Brecha, Annie Warmke (Blue Rock Station, LLC)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Manure is an abundant and renewable resource for livestock farmers that often goes unused. As manure breaks down, heat is released into the environment. When looking at this heat dissipation through the lens of sustainability, there is an opportunity to save energy by capturing the heat in manure decomposition and using it where it is needed. This research capitalizes on that opportunity to develop a way to heat water for livestock in the winter. Using a combination of passive solar energy and the natural heat produced through the decomposition of manure, a system has been designed and implemented to offer a low-cost, sustainable solution that combines mechanical engineering with an agricultural application. Further research and development will be completed for partial- to full-automation of the system.

### **Temperature dependent refractive index measurements for gallium nitride with implications for phase matched and quasi-phase matched optical frequency conversion devices**

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** Jack David Kunkel

**ADVISORS** Said Elhamri, D. Zelmon (WPAFB Research Laboratory)



**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Gallium nitride is a valuable material for optical and electronic applications due to its wide band gap and high thermal conductivity. Gallium nitride has the potential for being a valuable material in frequency conversion devices such as frequency doublers and optical parametric oscillators. Optical and mechanical characterization of gallium nitride, including the dependence of the refractive index on wavelength and temperature, is important for predicting the performance of devices using this material. The method of minimum deviation was used to measure the refractive index for wavelengths ranging from 0.400 to 5.20 microns and in temperatures ranging from 20 to 225°C. Results of this characterization will be presented along with calculations relating to phase matching and quasi-phase matching in optical parametric oscillators.

## Epitaxial titanium nitride on sapphire: Effects of substrate temperature on microstructure and optical properties

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** Hadley Anna Smith

**ADDITIONAL AUTHORS** K.G.Eyink, L.Grazulis, M.J.Hill, A.M.Urbas, B.M.Howe, A.N.Reed (WPAFB Research Laboratory)

**ADVISORS** Said Elhamri

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Titanium Nitride (TiN) is a mechanically-robust, high-temperature stable, metallic material receiving considerable attention for resilient plasmonics. In this work, we fabricated six hetero-epitaxial TiN films on sapphire using controllably unbalanced reactive magnetron sputtering. We examined the effect of substrate growth temperature on the plasmonic and crystalline quality of the film. Optical properties of all films were obtained from spectroscopic ellipsometry; plasmonic quality factors were determined from the real and imaginary parts of the dielectric function. We determined crystallinity using X-ray diffraction and surface morphology using atomic force microscopy. X-ray diffraction showed (111) TiN peaks with Pendellösung fringes indicating consistent hetero-epitaxy. Atomic force microscopy showed smooth surfaces with RMS surface roughness ranging from 0.2-2.6 nm. Based on this characterization, we determined that the substrate deposition temperature of 550°C yielded (111)-oriented hetero-epitaxial TiN with minimal surface roughness. We found that 550°C also gave highest plasmonic quality factors for all wavelengths, approaching the values of today's best plasmonic materials (such as Au and Ag). Further, the Q-factors at wavelength 1550 nm inversely correlated with calculated lattice constants indicating stoichiometric tuning of plasmonic properties. Our results indicate that the plasmonic response of TiN is directly linked with structural quality and stoichiometry of the film.

## Piezo-optic coefficient of gallium nitride

College of Arts and Sciences: Physics

Poster - Independent Research

**PRESENTERS** William Bradley Poston

**ADVISORS** Said Elhamri, D. Zelmon (WPAFB Research Laboratory)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Gallium nitride is a material of interest for a range of optical and optoelectronic applications, including its use in blue light LEDs, efficient solar cells, and high power optoelectronic devices for communications, radar, and power amplifiers. During high power operation, these devices develop temperature gradients which cause changes in the local refractive index due in part to the piezo optic effect, resulting in distortion of the output beam. Therefore, measurement of the piezo-optic coefficients is required to predict the performance of high power optoelectronic devices. Uniaxial mechanical stress was applied to a sample of gallium nitride, which induced a birefringence in the sample. The magnitude of the induced birefringence was determined by shining polarized light from a HeNe laser through the sample at pressures between .5 and 10 MPa, passing the output beam through a rotating polarizer and measuring the intensity as a function of relative polarizer position. From the induced birefringence, the piezo-optic coefficient of gallium nitride was determined.

## The Self-healing of Distorted Bessel Beams

College of Arts and Sciences: Physics

Poster - Capstone Project

**PRESENTERS** Marie Solange Tumusange

**ADVISORS** Andy Chinyu Chong

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

An optical beam is said to be self-healing when, distorted by an obstacle, the beam corrects itself upon propagation. A Bessel beam is known for its self-healing property. A Bessel beam is a non-diffracting light beam whose amplitude is described by a Bessel function. To demonstrate the self-healing of the Bessel beam, the beam is distorted and beam profiles are measured as the distorted beam propagates.

## Crystallinity and Surface Morphology of Reactively Magnetron Sputtered Aluminum Scandium Nitride

**College of Arts and Sciences: Physics**

Poster - Independent Research

**PRESENTERS** Rachel L Adams**ADDITIONAL AUTHORS** Z.J.Biegler, K.G.Eyink, L.Grazulis, M.J.Hill, B.M.Howe, A.N. Reed (WPAFB Research Laboratory); H.A.Smith (University of Dayton, Physics)**ADVISORS** Said Elhamri**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Aluminum nitride (AlN) is a low-loss piezoelectric that is commonly used in surface acoustic wave (SAW) and bulk acoustic wave (BAW) based filters for RF communication applications. It has previously been demonstrated that alloying AlN with scandium nitride (ScN) results in an increase of the piezoelectric coefficient up to five times greater than that of pure AlN without significantly increasing losses. This result could have significant impact on next-generation RF-filters. In order for this material to be incorporated into devices, a more thorough understanding of its growth, structural, electrical, and piezoelectric properties is needed. In this work, we investigate the role of deposition parameters during controllable-unbalanced reactive magnetron sputtering on the crystallinity, surface morphology, and composition of aluminum scandium nitride (Al<sub>x</sub>Sc<sub>1-x</sub>N) on (0001)-oriented sapphire substrates. The conditions considered in this study include the sputter power, the nitrogen gas fraction, the gas ion flux to metal neutral flux ratio (ii/iMe) controlled by the coil current on an external electro-magnet, the substrate temperature, and the sputtering target Al-to-Sc ratio. X-ray photoelectron spectroscopy was used to determine the Al, Sc, and N concentrations in the films. X-ray diffraction of the films showed that the crystallinity was dependent upon ii/iMe and substrate temperature. The surface morphology, determined using atomic force microscopy, showed a similar dependence.

**Do Normative and Pathological Personality Traits Overlap? A Conjoint Confirmatory Factor Analysis of the NEO-PI-3 and PID-5**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Lisa Eileen Stone**ADVISORS** Julie Walsh Messinger**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Historically, personality disorders have been conceptualized as qualitatively distinct clinical syndromes, based on operational criteria. Consistent with this model, ten distinct set personality disorder criteria are outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013). However, debate persists about the clinical utility of this categorical model, with many (Krueger, et al.) researchers supporting a dimensional model that focuses on pathological levels of normative personality traits. A recent exploratory factor analysis (De Fruyt et al., 2013) of the NEO Personality Inventory-3 (NEO-PI-3; Costa & McCrae, 2010) and The Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012), suggests that normative and pathological personality traits may fall under the same common set of domains: negative affectivity-neuroticism, extraversion-detachment, openness-psychoticism, antagonism-agreeableness, and conscientious-disinhibition. However, a confirmatory factor analysis (CFA) of this model has yet to be conducted. The purpose of this study is to further explore the relationship between normative and pathological personality traits and to test the De Fruyt et al. model by conducting a conjoint CFA of the NEO-PI-3 and PID-5. It is hypothesized that the PID-5 and NEO-PI-3 share the same underlying factor structure. Using mPlus, the model will be tested in separate samples of 300 undergraduate students at a private Midwestern university and 200 adults (> 18 years of age) from the surrounding Dayton community. Understanding the relationship between these two measures is important, as they are consistently used to diagnose and aid in treatment of individuals with personality disorders.

**The Effects of Adolescent Housing Condition and Voluntary Exercise on Alcohol Intake and Stress Response in Male Long-Evans Rats**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Caroline A Lynch**ADVISORS** Tracy R Butler**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Can regular exercise during adolescence, combined with living in a social environment, decrease both the negative effects of chronic stress and alcohol intake later in life? The aim of this research is to answer this question using a rat model that introduces a novel behavioral intervention in the form of regular voluntary exercise in order to counteract the negative effects of chronic stress caused by socially-isolated housing during adolescence. Chronic stress has been linked to the development of alcohol use disorders (AUDs) in humans, and this study attempts to both model and hamper this phenomenon in rats using voluntary exercise. Gaining an understanding of how housing conditions and exercise can play a role in subsequent alcohol intake and stress hormone levels may be useful for the advent of new pharmacotherapies for individuals with an AUD.

**Perceptions of Violence**

College of Arts and Sciences: Psychology

Poster - Capstone Project

**PRESENTERS** Abigail Pauline McIntyre

**ADVISORS** Dario Norman Rodriguez

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

System justification theory suggests that people tend to view authority figures as credible and dependable (Jost, Tyler, & Van der Toorn 2011). Individuals also tend to hold those who commit unsanctioned violence or exhibit criminal behavior in disdain. This study was designed to examine how these tendencies relate to people's perceptions of situations involving authority figures, vigilantism and violence. Two hypotheses were tested: that the victim of such an interrogation will be viewed less favorably and the attacker more favorably in cases where a low status victim is interrogated by an off-duty police officer, and that the victim will be viewed more favorably and the attacker less favorably in cases where a high status victim is interrogated by a vigilante. Participants' evaluations of characteristics of aggression, credibility, criminality and guilt were measured as they applied to police officers, vigilantes and suspected criminals.

## Physiological and Psychological Effects of Being Weighed in Female Participants

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Julia Christine Carroccio

**ADVISORS** Jacob M Burmeister, Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Stressful experiences such as constantly thinking about one's weight lead to harmful long-term physiological and psychological effects on the body. Many studies have examined the presence of weight stigma in society at large, but fewer studies have sought to determine the physical and psychological outcomes of that stigma. In the short-term, even momentary stressors could have an impact on factors such as blood pressure, for example when patients are stressed due to weighing before blood pressure is measured. This study tested whether female participants' (N = 55) attitudes about their bodies, anxiety levels, and blood pressures were affected by being weighed. The participants were 55 female undergraduate students from the University of Dayton who were enrolled in introductory psychology courses, or some other course that required research participation. It was hypothesized that being weighed would produce negative outcomes on measures of blood pressure, body satisfaction, self-esteem, and anxiety. Results of a one-way ANOVA indicated that these factors did not differ for participants who were weighed just prior to measurement compared to those who were weighed after. Thus there may be some limits to "white coat syndrome," which is the phenomenon of a patient having higher blood pressure readings when in the presence of a physician or other medical staff. Factors such as the setting and demographic of the person obtaining the measures could be relevant.

## Alcohol Deprivation Effect: An Investigation of a Model of Alcohol Dependence and Relapse Behaviors in Male and Female Long Evans Rats

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Hanna Jane Peterson

**ADVISORS** Tracy R Butler

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Humans that become addicted to alcohol and other drugs often relapse even long after becoming abstinent especially when they encounter stressors in life. Stress that a healthy person handles with coping mechanisms like exercise or talking to a friend, an addict may handle by resuming use of their drug of choice. People may also relapse if they re-enter an environment where they used the drug because of a learned association between that environment and the good feeling of the drug. In order to understand relapse behavior, a pre-clinical rodent model of relapse is used which models the important aspects of the human addiction and relapse condition. While a rodent model does not replicate every aspect of the human condition, it can model the aspects that are most important in addiction and relapse overall. The model used in this study is the alcohol deprivation effect (ADE) model. It has been found to model alcohol addiction and relapse in rats and can therefore allow for further understanding of relapse behavior as well as allow for testing of the effects of various variables like stress or therapeutic drugs on relapse behavior. However, before these further tests can be done, it must be clear that the model works in the Long Evans rats that are used in the lab. I am also interested in whether the ADE model yields similar results in male and female rats. This project will investigate the usefulness of the ADE model in Long Evans male and female rats by replicating a similar study done previously by Sinclair and Tiihonen (1988).

## Chronic administration of probiotic *L. rhamnosus* increases anxiety-like behavior in group-housed male Long Evans rats

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Parker Maddison Griff

**ADVISORS** Tracy R Butler, Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Early life stress is a risk factor for later development of alcohol use disorders and anxiety disorders in humans. Using rodent experimental models, we know that rats experiencing social isolation as early-life stress exhibit greater anxiety-like behavior and alcohol consumption than rats housed in groups. Examining potential preventive strategies, we investigated the effects of probiotics, which have previously been shown to decrease rodent anxiety-like behavior, on the relationship between early-life stress and anxiety-like behavior in rats. We hypothesized that probiotics consumption would decrease anxiety-like behavior in socially isolated rats, as well as in rats housed in groups. To our surprise, we found that the probiotics had no significant effect on anxiety-like behavior for socially isolated rats but significantly increased anxiety-like behavior in rats housed in groups. Our results suggest probiotics do not have a positive benefit to alleviate consequences of early life stress and raise caution for their therapeutic use.

## **Olfaction and Disgust as predictors of Elevated Perfectionism**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Maia A McLin

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Olfaction aided in survival by providing a means to assess if foods were safe to consume. This assessment may have increased chance of survival by decreasing the likelihood of consuming contaminated foods leading to an evolutionary advantage (Rozin & Fallon, 1987). Disgust and olfaction are not key in survival today because of current regulations that prevent the distribution of spoiled and contaminated foods. It is possible that disgust sensitivity and the perception of normally perceived pleasant odors as unpleasant act as a disadvantage in those diagnosed with obsessive-compulsive disorder and obsessive-compulsive personality disorder. This study will examine associations between rigid perfectionism, odor detection sensitivity, perceived pleasantness of odors and disgust sensitivity. Approximately 80 undergraduate students from the University of Dayton will be assessed for odor detection sensitivity, odor identification accuracy, and complete three self-report questionnaires assessing personality traits and disgust sensitivity. Odor sensitivity will be tested with Sniffin Sticks Odor Detection Threshold test (Burghart Instruments; Hummel, Sekinger, Wolf, Pauli, & Kobal, 1997), perceived odor pleasantness with Sticks odor identification test (Burghart Instruments; Hummel et al., 1997). The three self-report measures used are the NEO Personality Inventory-3 (NEO-PI-3; McCrae, Costa & Martin, 2005), the Personality Inventory for DSM-5 (PID-5; Krueger, Derringer, Markon, Watson, & Skodol, 2012), and the Disgust Scale-Revised (Haidt, Mccauley & Rozin, 1994). It is predicted that elevated perfectionism will be associated with lower odor detection sensitivity, lower pleasantness, higher disgust scores, and higher neuroticism. This study may provide further understanding of relationships between perfectionism, disgust and olfaction, and may also help identify possible target areas for Obsessive Compulsive Personality Disorder treatment by changing odor perceptions.

## **How Academic and Extracurricular Workload affects Stress Levels, and Consequently Mental and Physical Health of College Students**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Aidan Paul Koch

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Academic workload and extracurricular involvement can be sources of stress for college students Academic workload is characterized as the student's major, course work and future graduate school and/or career path plans. Extracurricular involvement can pertain from anything to intramural sports to being the President of a student organization. The current research seeks to investigate changes in mental and physical health over a semester by examining physiological stress levels in college students, in conjunction with academic workload and extracurricular involvement. Previous research finds an association between stress and physical health (Peer, Hillman, Van Hoet 2015). Studies have shown sympathetic nervous system activation due to stressors in people's lives (Conley & Lehman, 2012). Mental Health has also been shown to decrease when stress is overwhelming in the lives of college students (Murff, 2005). The goal of the present work is to examine academic workload, extracurricular involvement, physiological stress, and mental and physical health over the course of the semester to better understand how they are associated. Using a longitudinal design, participants will complete measures of mental and physical health, as well as academic workload and extracurricular involvement at the beginning and end of the fall semester. Physiological stress will be assessed at each time point by collecting a saliva sample from participants in order to measure the hormone cortisol.

## **Personality Types and Self-Reported Eating Habits**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Tom Richard Lawler

**ADVISORS** Jacob M Burmeister, Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

People with different personality types lead very different lifestyles; these personality types also affect the eating habits of an

individual. Poor eating habits can lead to a myriad of health problems, including obesity and diabetes, while healthy eating habits can promote longevity. An associated problem is inaccurate reporting of eating habits by research participants and medical patients. While many studies have been conducted to examine the relationship between eating disorders and personality types, very few, if any, have examined the effects of personality types on actual eating habits as well as perceived eating habits. The proposed study will test for associations between personality traits and eating habits and inaccuracy in self-reported eating habits. Using the five factor personality model, participants will be given a questionnaire to assess the personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism. Participants will then be given two more questionnaires to determine their actual eating habits and their perceived eating habits. The actual eating habits will be determined using the Self Reported Habit Index, a rigorous eating habit assessment that can accurately determine the habits of an individual. Participants' perceived eating habits will be assessed using a questionnaire designed specifically for this study that will assess their general view of the healthiness of their own eating habits. Participants will be gathered via Amazon's Mechanical Turk. Through analysis of this data, conclusions will be drawn about the susceptibility of various personality traits to detrimental eating habits. Additionally, the discord between perceived and actual eating habits will be determined to provide insight into the attitudes of individuals regarding their own eating habits. This information will equip medical professionals and dieticians with knowledge about how to best accommodate patients with poor eating habits and provide them with top-notch treatment.

### **Urban Gardening Initiative for the Enhancement of Wellness and Environmental Attitudes of Service-Learning Research Assistants: A Participatory Community Action Research Project within Local Homeless Shelters**

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Alicia Michelle Selvey

**ADVISORS** Charles Allan Hunt, Roger N Reeb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homelessness is a complex and pervasive community problem that affects all levels of society. This collaborative Participatory Community Action Research Project between Dr. Roger N. Reeb (Roesch Endowed Chair in the Social Sciences, Professor of Psychology, University of Dayton) and administrators at St. Vincent de Paul (Dayton, Ohio) implements Behavioral Activation at local homeless shelters as a way to address this pervasive problem within our community. Behavioral Activation, a form of operant conditioning, refers to a therapeutic strategy that attempts to increase overt behaviors by bringing a person into contact with positive response-contingent reinforcement. This enhances positive thinking, mood, quality of life, and the pursuit of personal potential. The project, which began in August of 2013, is implemented at both the Men's Shelter and Women's Shelter and has recruited well over 1,500 residents and served countless more. The project utilizes service-learning pedagogy; community members, faculty, and graduate and undergraduate students contribute to the project in various ways. Based on quantitative findings, shelter residents perceive Behavioral Activation sessions as meaningful, worthy of repeating, and enjoyable. Furthermore, quantitative findings indicate that, as shelter residents participate in the project over time, they perceive Behavioral Activation as contributing to key psycho-social factors as follows: hope, capability and motivation for education or work, purpose or meaning in life, and social/emotional support. Additionally, the project has contributed to creating a healthier social climate within the shelter, as evident by qualitative analyses; the data has revealed important emergent themes (e.g., importance of student-resident relationships in supporting psycho-social improvements). This proposed research involves the establishment of an urban garden within the context of the Behavioral Activation project. In addition to enhancing nutrition for shelter residents, this research will examine pre-to- post semester outcomes (wellbeing, environmental attitudes and behavior) for service-learning students who implement the urban gardening initiative.

### **The Other Woman: Women's Tendencies to and Perceptions of Mate Poaching Across the Menstrual Cycle**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Margaret Marie Jaeger

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Mate poaching, or romantically pursuing an individual already in a committed romantic relationship, is a potentially hazardous mating tactic for women, as it opens them up to retaliation from scorned women. Because of this danger, from an evolutionary perspective, mate poaching would be most valuable to a woman when she would benefit most from the poached partner in the form of offspring, or when a woman's conception risk is at its highest. Research in the field strongly suggests that women who are partnered to genetically desirable men are wary of ovulating women because of their tendency to mate-poach. The present work examines this relationship more closely. The first experiment examined if women were in fact more likely to mate poach when they are ovulating as opposed to when they are not. The second experiment examined how women perceive other, ovulating women that they imagine are interacting with their significant other.

### **An Investigation into Bullying and Cyberbullying: The Effects of Anonymity and Form of**

## Bullying on Severity of Victim Impact

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Ashley Marie Harrison

**ADVISORS** Jackson A Goodnight

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Bullying has been a problem for many years, but due to the development of electronic communication, cyberbullying in particular has recently become a widespread problem (Boulton, Hardcastle, Down, Fowles, & Simmonds, 2014). Research suggests that cyberbullying may have a greater negative impact for victims than traditional bullying (Gilroy, 2013; Walker, Sockman, & Koehen, 2011). Previous research suggests that cyberbullying may cause impaired mental health and psychological distress and may increase risk factors for suicide among college students (Zalaquett & Chatters, 2014). Research also suggests that when the victims do not know the identity of a perpetrator, it decreases the perceived control the victim has over the bullying situation (Sticca & Parren, 2013). It was hypothesized that cyberbullying victimization would be associated with greater depression and anxiety than traditional bullying victimization alone, and that higher levels of perpetrator anonymity, reduced control, and increased frequency of victimization would explain, or mediate, this difference. Mediation analyses indicated that a reduction in perceived control significantly mediated the association ( $b = .09$ , 95% CI = .006 to .246) between cyberbullying and depression. Mediation analyses also revealed frequency of bullying to significantly mediate the association ( $b = -.08$ , 95% CI = -.204 to -.005) between cyberbullying and anxiety. These findings indicate that students who experience cyberbullying in addition to traditional bullying, compared to those only experiencing traditional bullying, experienced higher levels of anxiety and depression owing to a reduction in perceived control and an increase in frequency of victimization. These findings suggest that negative consequences of bullying in college may be mitigated by promoting awareness among students to increase their perceived control. Findings also suggest that risk for depression and anxiety in college may be mitigated by promoting bullying prevention programs to reduce frequency of cyberbullying victimization.

## Urban Gardening in a Participatory Community Action Research Project at Homeless Shelters: Enhancement of Wellness and Vocational Readiness for Shelter Residents

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Katey M Gibbins

**ADVISORS** Charles Allan Hunt, Roger N Reeb

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Homelessness is a ubiquitous community problem that exists at the local, national, and international levels. This Participatory Community Action Research Project represents a collaboration between Dr. Roger N. Reeb (Roesch Endowed Chair in the Social Sciences, Professor of Psychology, University of Dayton) and administrators at St. Vincent De Paul (Dayton, OH). This project, which began in August of 2013, implements Behavioral Activation sessions at local men's and women's homeless shelters and well over 1,500 shelter residents have participated in the Behavioral Activation project thus far. Behavioral Activation is based on operant conditioning, refers to a therapeutic strategy that attempts to increase overt prosocial behaviors that bring a person into contact with reinforcing environmental opportunities, and thereby enhances thoughts, mood, quality of life, and actualization of inherent potentialities. This project also utilizes service-learning pedagogy, with faculty, community partners, graduate students, and undergraduate students working together to implement Behavioral Activation sessions within the shelters. Quantitative findings, which have been presented at numerous conferences, indicate that shelter residents perceive individual Behavioral Activation sessions as meaningful, worthy of repeating, and enjoyable. Over time, quantitative findings also indicate that participants perceive the Behavioral Activation Project as contributing to their sense of hope, capability and motivation for education/work, purpose or meaning in life, wellbeing, quality of life, social/emotional support, and improved social climate. Qualitative data support these quantitative findings and also reveal important themes (e.g., importance of student-resident relationships in supporting psychosocial improvements). This proposed research involves the establishment of an urban garden within the context of this project. In addition to yielding produce to enhance nutrition for shelter residents, this research will examine pre-to-post improvements in wellbeing in shelter residents who participate in the farming initiative.

## Smelling How to Feel: Does Ambient Odor Affect How We Evaluate and Recall Emotional Stimuli?

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Michael Alexander Lee

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Olfaction, or the sense of smell, is a ubiquitous element of the human experience. Odors are all around us and can arouse a wide range of feelings or even stir vivid memories. While studies have found that odor can influence people's evaluation of various types of stimuli, no study has shown how odor can influence how people rate the emotional content of visual stimuli, nor has it been shown how it might affect our ability to recall such stimuli. Odor's ability to affect how we evaluate and recall emotionally-charged stimuli could carry deep implications for how olfaction impacts our daily lives. This study seeks to examine how odors that carry

different hedonic values affect how participants rate and recall emotionally-charged visual stimuli. Prior to the study, participants will complete an online survey where they rate the emotional valence of a collection of images from the International Affective Picture System (IAPS), which will be evenly divided between positive, negative, and neutral valence. The initial portion of experimental session will take place in a room in which either a pleasant odor, an unpleasant odor, or no odor will be present. Participants will be presented with a subset of images from the survey and asked to rate them again for valence and arousal. Immediately afterwards, participants will complete a recognition task where they will be presented with a larger collection of images and asked if they recall seeing each image earlier in the session. Finally, participants will be moved to another room without odor, complete roughly 30 minutes of distraction tasks, then complete a delayed recognition task. This task will follow the same procedure as the earlier recognition task, with the additional component of rating each image for arousal and valence. This project is expected to be completed in spring of next year.

### **Personality and Health Risk Information Avoidance**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Kelsey Michelle Julian

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

When it comes to personal health risks, some people will choose to avoid information that may be threatening to their beliefs, behaviors, or overall self-image. While many studies have been performed to discover methods that may help to reduce information avoidance, there has been little research regarding the personality characteristics of people who are more likely to engage in information avoidance. The present study will utilize a conceptually similar paradigm from previous research in which participants are led to believe that they will be able to find out whether they are at risk for an illness during their lab experience. Participants will complete personality questionnaires and then will be asked to provide a saliva sample in order to be tested for ostensibly real predisposition to alcoholism detectable in saliva. Participants will then decide if they would like to get their test results back or not. In addition to examining whether certain personality characteristics are associated with information avoidance, the saliva will be assayed for the stress hormone, cortisol, to examine whether physiological stress is associated with personality and information avoidance.

### **The Influence of Self-Esteem and Stress on Academic Performance in College Students**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Angel Joshua Pagan

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The proposed research seeks to examine the association self-esteem, how one perceives their abilities and worthiness in society, on the human stress hormone, cortisol. According to Lazarus & Folkman (1984), stress occurs when perceived environmental demands exceed one's ability to cope with them. The majority of research available pertains to elevated levels of the hormone due to physical, external and internal stressors, but lack in the dimension of investigating self-esteem. The proposed research seeks to expand the body of work regarding the causes of stress and self-esteem on academic performance. Current research states if an individual does not believe he or she is competent, significant or worthy, heightened appraised stress can be expected to occur (Eisenbarth, 2012); therefore, it is hypothesized that an individual who has a perceived low self worth (low self-esteem) will have increased levels of cortisol, leading to lower academic performance. In contrast, individuals with high-perceived self worth (high self-esteem) will have lower levels of cortisol, which will contribute to higher academic performance. The proposed two-part study will use the data collected to find the association between self-esteem and stress, via the steroid hormone cortisol, on the participant's actual academic performance. These findings will be compared to illustrate the correlation between the variables to add to the body of work pertaining to factors that influence academic performance.

### **Sex Differences in Concussion-Related Attitudes Among College Students**

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Pat William Dwyer

**ADVISORS** Joshua M Ricker, Mark Gordon McCoy (Bowling Green State University)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Every year there are 300,000 – 3.8 million concussions sustained in the United States. Due to the prevalence of this injury and an increased understanding of it that has developed over the past decade, concussions have become a topic of much concern and conversation. Previous research has shown that factors such as having children, socioeconomic status, a person's own concussion history, and amount of time available for education, among many others can influence attitudes and knowledge about concussion. The current study sought out to understand the influence of the sex an individual and college education on multiple concussion-related attitudes. We developed a survey to assess the attitudes of college students on a range of topics surrounding concussions. 200 students at the University of Dayton were surveyed, and from our pre-test data we found significant differences in attitudes on a few questions between sexes. Males were more likely to report a higher opinion of the way professional sports leagues have handled the concussions in general. Also, males were more likely to report that they felt the monetary benefits to playing sports

outweighed the risks associated with sustaining a concussion. Finally, females felt more strongly that there should be laws created and enforced in relation to concussion management for youth sports. Our results indicate that sex differences emerge in various areas of concussion-related attitudes.

### **Influence of positive illusions and stress on weight gain in college students**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Olivia Grace Grondalski

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

With majority of overweight or obese children growing up to be overweight or obese adults, understanding different influences on eating and exercise at an integral transition period into adulthood is paramount. There are several different influences on physical health from genetics to environmental factors, however, the relationship between self-enhancement and weight gain is largely unstudied. The purpose of this proposed longitudinal study is to understand the influences of positive illusions, in the form of self-enhancement, on changes in weight of college students and the role stress plays in this relationship over time. At the beginning of the semester, students will participate in Time 1, and have their height and weight recorded. Body Mass Index will be calculated using the standard equation of weight in kilograms divided by height-squared in centimeters. Then participants will complete a series of questionnaires on the computer that are relevant to the current proposal. These questionnaires include the body dissatisfaction scale to assess perceived body mass index, and self-reported stress. The Body Dissatisfaction Scale (Mutale, Dumm, Stiller, & Larkin, 2016) will be used to assess how the participant perceives their body. Participants are presented with body size images that vary in size. For each body size presented, the weight and BMI have been calculated. The difference between the participant's actual BMI and their perceived BMI will be calculated. Self-reported stress will be assessed using the Perceived Stress Scale (Cohen, Kamarck, and Mermelstein, 1983). Actual stress will be measured in the form of cortisol. Cortisol is a steroid hormone secreted by the adrenal glands. It is hypothesized that students with high self-enhancement, and physiological stress will influence weight gain throughout the semester.

### **Caffeine Rush! Examining the Effects of Caffeine on Spatial Working Memory.**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Alexander N Lawriw

**ADVISORS** Susan T Davis

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Caffeine is well-known for its ability to make a person feel more attentive, more alert, and less fatigued, but could this popular stimulant also help improve a person's memory, as well? Prior research suggests that caffeine might be a cognitive enhancer with participants showing improved performance on short-term memory tasks such as the recall of word lists (Arnold et al., 1987; Barraclough & Foreman, 1994; Rogers & Derroncourt, 1998; Ryan et al., 2002; Schmitt, 2001a, b). However, conflicting results using similar tasks have called these findings into question. On top of this, the overall body of research concerning caffeine and memory has tended to focus solely on relatively simple assessments of newly established episodic memory, leaving a glaring gap in the literature when it comes to other types of memory (e.g., semantic memory). The present research aims to fill this gap by studying caffeine's potential effects on spatial working memory, the temporary storage, maintenance, and manipulation of spatial information. In the experiment, participants were asked to complete levels of varying difficulty within a computerized version of the popular puzzle game, Rush Hour, after consuming either a 200 mg caffeine pill or a placebo. Rush Hour requires the player to move a designated red 'target' car to the exit of a 6 x 6 grid. Blocking the exit are other cars that can only be moved horizontally or vertically depending on the direction they are facing. Participants must use the spatial information of the grid layout in order to complete the levels as efficiently as possible. We hypothesize that those participants given caffeine will complete these levels quicker and with fewer errors than those given a placebo. However, this increase in performance may be limited on more difficult levels due to increased workload and ensuing stress.

### **Does self-enhancement affect spending behavior? An experimental analysis**

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Mark A Matthews

**ADVISORS** Erin Marie O'Mara

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This project aims to examine the extent to which self-enhancing, bolstering one's views of oneself, uniquely affects spending behavior. Self-enhancement is associated with both improving self-esteem (Hepper, et al., 2010), well-being (O'Mara et al., 2012), and positive affect (Bonanno et al., 2005), all variables that affect spending well-being (Babin & Attaway, 2000; Yurchisin et al., 2008). Therefore, it is likely that self-enhancing will affect one's spending while shopping, as well as their overall well-being after shopping. Participants will complete measures of their current mood and self-esteem. Participants will then be randomly assigned to one of three conditions. In the self-enhancement condition, participants will think about their most important trait and write about how



this trait is more characteristic of them than other college students. In the affect condition, participants will think about recent positive event that occurred in their life and will reconstruct how that event came to be. In the control condition, participants will not perform any task. All participants will then complete measures of mood and self-esteem again, followed by a shopping simulation in which they will be asked to shop for items from the UD bookstore. Last, participants will complete measures of their overall well-being, including measures of mood, stress, anxiety, depression, and satisfaction with life. It is hypothesized that participants in the self-enhancement and the positive affect condition will spend more money and experience higher well-being than participants in the control condition. It is also hypothesized that participants in the self-enhancement condition will spend less money than participants in the affect condition.

### **An Evaluation of Contrasting Views of University Campus Concealed Carry**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Capstone Project

**PRESENTERS** Kyle H Dobies

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Today a majority of states have laws that prohibit guns from being carried on university campuses. However there are a few that have enacted laws that protect the rights of individuals who choose to carry a firearm. In select other states the decision is ultimately placed upon the university or college to prohibit or allow students and staff to carry weapons on their campus, even though it may be legal by state law. With recent cases of violence on college campuses, many states have completely prohibited firearms while a few others have legalized it. The purpose of this research is to examine state gun legislation and perceptions of concealed carry on campus from the individuals that it directly affects: university staff and students. Additionally, how concealed carry has changed and progressed over recent decades involving times of war, terrorist threats, school shootings, and other fears will also be analyzed.

### **Cross-Cultural Medical Interpretation: A Proposed Certificate for the University of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Honors Thesis

**PRESENTERS** Kevin Laurence Outwater

**ADVISORS** Simanti Dasgupta

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The medical profession today is anchored with English as the primary language. Therefore, some individuals may struggle to communicate, causing the usage of interpreters to lower the burden for these patients. This interpretation model is going to address not only the primary skills of medical interpreters, but will also address languages and culture, in attempt to highlight meanings, and integrating other cultural notions. Since the demographics in the United States is changing, it is necessary to adapt these language and cultural changes to the medical field. Through this, I propose this interpretation model to be incorporated at the University of Dayton, becoming a medical interpretation certificate. This would follow the University's belief in "Commitment to Community" by engaging with members of the Dayton area.

### **How poverty affects the management of a water contamination crisis in the city of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Alyssa Marie Miller

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The city of Dayton prides itself on the quality of its water. However, contamination at the Behr Plant, which is the former site of Chrysler and now a Superfund site, in Northern Dayton threatens the health of residents in that area. This presentation explores the demographic and socioeconomic characteristics of those who live around the site and whether those characteristics help us to understand the level of power and privilege local residents had in the various stages of site contamination. To do this, I draw on sociological literature, Facing Project Narratives (a program from the University of Dayton), and local Dayton news articles. Additionally, I will compare past and present northeastern Dayton neighborhoods affected by the contamination and I will observe if any policies have been passed to avoid such catastrophes in the future.

### **Media Portrayal on the Legalization of Marijuana in Colorado and Ohio**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Capstone Project

**PRESENTERS** Quinn Marie Carlson

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In order to have a better understanding on the legislation of the legalization of marijuana in Colorado and Ohio, I will be conducting a

content analysis on media portrayal. The study will be done through news articles that discuss the legalization of marijuana throughout Ohio and Colorado. The media that I will be using will come from national news sources, from all spectrums on the political scale. The reason for this is so that I have diverse articles, with varying opinions and ideologies behind the writers of the media. I will have a set of guidelines of questions to ask when determining which media to use. Some of these questions will include, "For what audience was it produced?" "Is an opinion shown or given in this article?" and "When was it produced?" These will help me organize and filter through various media that I am exposed to and to create a systematic way to analyze the media. The overall purpose of this research will be to examine the media portrayal of the legalization of marijuana in both Colorado and Ohio. More specifically, if the way that news articles from a national level are portrayed has any bearing on whether or not marijuana legislation passed in the two previously listed states.

## **21st Century Policing in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Capstone Project

**PRESENTERS** Max Hunter Boorsma

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In light of the 2015 Presidential Task Force on 21st Century Policing (Task Force), police departments across the country have been adapting with the ever-changing culture of the United States. The Task Force highlights six pillars essential to effective modern policing that are discussed throughout this research, with an emphasis on pillar one, Building Trust and Legitimacy and pillar four, Community Policing and Crime Reduction. This research attempts to answer the questions of how the Dayton Police Department (DPD) is engaging with the findings of the Task Force and how the public perceives the Dayton Police Department. Exploring the first research question, this research analyzes DPD programs in relation to the Task Force pillars. Discussion of the DECA Taft Seminar highlights the focus on Problem Oriented Policing (POP) and Community Oriented Policing (COP) in relation to pillars one and four. A content analysis of twitter is used to explore the public perception of the DPD. This is an analysis of all 2017 public tweets from twitter users in the Dayton area, which include the key word 'police'. Discussion of DPD programs in relation to the Task Force pillars allows for analysis and recommendations based on relevant literature. The objective of this paper is to highlight connections between the DPD and the Task Force and to gauge the success of DPD programs based on public perception.

## **Trends In Private Fixed Investment: And the 2008 Recession**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Bennett Alexander Zynn

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In recent years a number of financial economists have been concerned about the lack of growth in capital investments by business firms. In this study I look at the intermediate and long term trends in private fixed investment (PFI) to determine if the severe recession in 2008 has altered business investment growth. Since PFI is divided into structures, equipment and intellectual property (e.g. computer software), it is important to evaluate these sub category trends as well. My research design is as follows; 1) I develop linear trend equations for the periods between time periods 1999-2007 and 2009-2017 to determine if the regression coefficients are significantly different. I test the hypothesis that the b coefficients for the 1999-2007 period are greater than the b coefficients for the 2009-2017 period, 2) I run linear regressions for the complete period of 1999-2017 and include a dummy variable  $D_1$  and set it equal to one for the 4 quarters in 2008 to determine if there is a downward shift in the regression line due to the 2008 recession, 3) Finally, in the 2009-2017 period there is evidence of a pick-up in both gross domestic product and gross domestic income over the latter half of this period. To see if there is a structural shift upwards in the regression line, I add a second dummy variable,  $D_2$  and set it equal to one for the 12 quarters in 2015, 2016, and 2017. I test the hypothesis that an extremely low unemployment rate, steady employment growth and low interest rates have combined to cause an upward shift in private fixed investment in recent years.

## **The Inverse of the Coefficient of Variation as a Portfolio Weighting Factor: An Empirical Analysis of Returns for the Consumer Discretionary Sector 2019-2017**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Emily Marie Teutsch

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Portfolio stock weights based on the mean-variance proposition suggests that investors for any given level of risk will attempt to maximize returns and for any given level of return, will attempt to minimize risk. In this study, I used the inverse of the coefficient of variation (COV) as a proxy for the investor's return/risk ratio. Using  $1/COV$ , I develop portfolio stock weights for the 20 top stocks by market value in the SPDR Consumer Discretionary sector ETF (XLY). I give higher weights to stocks with higher return/risk ratios and rebalance these ratios annually. I use a 3-year moving average of stock returns to capture the return/risk ratios. Performance is calculated for the years 2009-2017. The benchmark is the S&P 500 SPDR ETF SPX.

## U.S. Inflation Trends and the 2008 Recession

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Alison M Berry, Carmen May DeRose

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The U.S. Federal Reserve Board uses long term inflation trends and projections to guide its policy decisions on controlling inflation. The objective of this study is to determine if the severe recession in 2008 altered the long term trend in inflation. Using the Consumer Price Index (CPI) as well as the Personal Consumption Expenditure Index (PCE) for our measures of inflation, we first divide the overall period of analysis into two nine year periods, 1999-2007 and 2009-2017, with 2008 the inflection point. Using linear regression with time as the independent variable, we develop regression coefficients (B) for both nine year periods and test the hypothesis that the 1999-2007 B coefficient is larger than the 2009-2017 B coefficient. If the hypothesis is correct, the difference in the B coefficients can be considered a proxy for the 2008 recession effect on trend inflation. We also run another test where a linear regression is run for the complete period but a dummy variable, D1, is added to the equation line with D1=1 for the 12 months in 2008. We test for a negative coefficient attached to D1, which indicates a downward shift in the regression line and provides another measure of the effect of the 08 recession on the inflation trend. Finally we test for a Phillips Curve effect on inflation trend in the 2009-2017 period. With U.S. unemployment reaching a rate around 4% during the last third of the 2009-2017 period, we run another trend regression but add the dummy variable D2 for the months in 2015, 2016, and 2017, in order to test for an upward shift in the inflation regression line. A positive coefficient attached to D2 would suggest the presence of the Phillips Curve affect.

## Investing in S&P 500 Stocks: Do Size and Value Still Matter

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Margaret Eileen Schutter

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Empirical research by financial economists show that small cap stocks outperform large cap stocks and value stocks outperform growth stocks over long periods of time (20 years or more). In this study, I extend the previous research by examining returns to portfolios based on size and value but over a much shorter time period, 2009 – 2016, to determine if the traditional outperformance patterns still hold. The 2009 – 2016 period is important because it includes the market rebound from the 2008 recession and has all the appearances of a long run bull market. It is also impacted by one of the most aggressive monetary easing policies in U.S. history. The universe of stocks is the S&P 500. Portfolios are rebalanced yearly.

## A Fundamentals Based Portfolio Weighting Model for the Information Technology Sector: An Empirical Analysis: 2009-2017

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Sallie Rebecca DeYoung

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

A central proposition in finance theory is that investors are risk averse and attempt to minimize the risk relative to expected returns regardless of the particular asset class being considered as an investment. In this study, I combine a fundamentals-based approach to portfolio weighting with a measure of return relative to risk to generate portfolio performance for the Top 20 Stocks by market value in the SPDR Information Technology Sector. I use a three-year moving average of each stock's earnings per share to calculate the inverse of the coefficient of variation ( $1/cov$ ), a return-risk ratio. Higher portfolio weights are given to stocks with higher  $1/cov$  ratios. Stock weights are recalculated each year so that the portfolio is rebalanced annually. The initial investment is \$1,000,000. Portfolio returns are generated for the years 2009-2017 and the performance benchmark is the SPDR S&P 500 ETF (SPY).

## Technical Analysis and S&P 500 Sector Returns, 2010-2016

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** John Tausch Gizzie

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The efficient market hypothesis suggests technical analysis has no role to play in determining stock or portfolio returns. In practice, however, a large number of investment managers employ technical analysis to generate excess returns or alpha relative to the market. In this study, I test an intermediate, to long-term horizon technical analysis measure, the 200 day moving average (MA200),

to determine if it generates portfolio alpha. The top ten stocks by market value in the SPDR sectors Consumer Discretionary (XLY), Information Technology (XLK), and Health Care (XLV) are treated as stock portfolios and each stock's MA 200 is used as the portfolio weighting metric. The weighting decision rules are: (1)  $P > MA_{200}$  receives higher weights and (2)  $P < MA_{200}$  receives higher weights. The period of analysis is 2010-2016 and the benchmark is the S&P 500 ETF (SPY).

### **Gross Domestic Income and Stock Returns: An Empirical Analysis, 2009-2017**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Michael Anthony Capicotto, Evan J Willmann

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Most financial economists agree that macroeconomic factors, as exogenous variables, must be included in asset pricing models in order to explain the variation in expected returns. In this study, I test the hypothesis that Gross Domestic Income (GDI) explains stock market price movements over time. I use linear regression analysis to identify the covariation between GDI and the top ten stocks by market value in the following SPDR sectors; (1) Healthcare, (2) Consumer Discretionary, (3) Information Technology, and (4) Industrials. Based on the regression coefficients (B), I develop portfolio weights for the stocks within each sector, with higher weights given to stocks with higher B coefficients. Assuming a \$1,000,000 investment in each sector portfolio, I calculate returns for the years 2009 - 2017. I also calculate out of sample returns for the first two months in 2018. The benchmark portfolio used to determine excess returns is the SPDR ETF SPY.

### **Size, Value, and Profitability in the Cross Section of Returns: An Empirical Analysis, 2008 - 2017**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** William Binnie

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In this study I extend the analysis of Fama and French and Novy-Marx on the effect of firm size, value and profitability on a portfolio's excess returns. The period analysis is 2008 -2017. For this analysis I use the same metrics for size (market value) and value (price to book) as Fama and French but differ in my measure of profitability. I use return on invested capital (ROIC) instead of return on equity or gross operating profits as a percent of assets because ROIC is considered a better measure of measure of the efficient allocation of capital as well as the firm's ability to generate economic value added. I test the following hypothesis. 1.) High ROIC large cap stocks outperform low ROIC large cap stocks 2.) High ROIC small cap stocks outperform low ROIC small cap stocks 3.) High ROIC value stocks outperform low ROIC value stocks 4.) High ROIC growth stocks outperform low ROIC growth stocks

### **Trends in Retail Sales Pre and Post 2008 Recession**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Luke Anthony Bir

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

One of the key indicators of the robustness of consumption spending in the U.S. economy is retail sales. In this study, I look at long term trends in retail sales, both pre and post the 2008 recession to determine if the sales trends have been materially altered after the 2008 recession. Using regression analysis, I develop time-trend regressions for two time periods 1999-2007 and 2009-2017. I test the hypothesis that the regression B-coefficient for the 1999-2007 period is larger than the B-coefficient for the 2009-2017 period, with the difference a proxy for the recession effect on retail spending. I also look at the e-commerce component of retail sales and carry out the following analysis: (1) I develop trend regressions for e-commerce sales pre and post 2008 recession and (2) I develop trend regressions for the ratio of the e-commerce sales to total retail sales pre and post 2008 recession. I expect the e-commerce B-coefficients to be larger after the 2008 recession.

### **A Smart Beta Portfolio Model fo the SPDR Healthcare Sector: An Empirical Analysis, 2009-2017**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Casey (Patrick) Casey Marsh

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In recent years a large number of Exchange Traded Funds (ETFs) have opted for fundamentals based portfolio stock weights rather

than equal-weighted or market value weighted. Fundamentals-based weighting models are often referred to as smart beta models because they create stock betas more closely aligned with a stock's intrinsic value. In this study I developed a smart beta portfolio weighting model for the SPDR Healthcare Sector. I selected the top 20 Healthcare Sector stocks by market value as my test portfolio and based on a three year moving average of earnings per share I generated portfolio weights using the inverse coefficient of variation ( $1/\text{Covariation}$ ). Since ( $1/\text{Cov}$ ) is essentially a return-risk ratio, I gave higher weights to stocks with higher return-risk ratios. The portfolio weighting model is re-balanced annually. Portfolio Performance is calculated for the years 2009-2017 and the benchmark is the S&P 500 ETF (SPY).

### **Smart Beta Modelling : The Case for Cyclically Adjusted Price/Earnings Ratios**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Nicholas Christopher Jacobs, Dan Edward Wollenberg

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Schiller's Cyclically Adjusted Price/Earnings Ratio (CAPE) has been used by financial economists to determine the direction of the stock market, up or down. In this study, we develop portfolio weighting models with CAPE as the weighting factor. We use two weighting decision rules: 1.) Higher weights are given to stocks with higher CAPE ratios and, 2.) Higher weights are given to stocks with lower CAPE ratios. The top ten stocks within the Consumer Discretionary, Consumer Staples, Industrials, Healthcare, and Information Technology sectors are used to test the alpha generating capability of the CAPE weighting factor. The returns for CAPE weighted portfolios are calculated for the years 2010-2016. The benchmark portfolio is the S&P 500 ETF SPY.

### **A Smart Beta Portfolio Model for the SPDR Industrial Sector: An Empirical Analysis, 2009-2017**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** Will Luis Perez

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Based on Rob Arnott's foundational work on using stock fundamentals to weigh portfolios of stocks, I developed a smart beta portfolio weighting model for the top 20 stocks by market value in the SPDR Industrial Sector. The model uses a portfolio weighting factor based on the coefficient of variation (COV). In essence, a stock gets a higher weight if the  $1/\text{COV}$  (the return-risk ratio) is higher compared to other stocks. A three year moving average of earnings per share is used to calculate the return/risk ratio for each stock. The return-risk ratios are updated yearly with actual portfolio returns generated for the years 2009-2017. The performance benchmark is the S&P 500 ETF (SPY).

### **Forecasting U.S. Inflation**

School of Business Administration: Economics and Finance

Poster - Independent Research

**PRESENTERS** John Martin Harmon

**ADVISORS** Tony S Caporale, Robert D Dean

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The U.S. Federal Reserve relies on a target rate of inflation of 2% to determine monetary policy actions regarding raising or lowering the federal funds rate. If the actual rate of inflation is above 2%, a tightening of monetary policy usually occurs. Conversely, an inflation rate below 2% can lead to a policy of monetary easing. The purpose of this study is to develop a time trend forecasting model of inflation to determine if expected inflation rates are above or below the target rate. Using CPI and CPI less food and energy as the measures of inflation, forecasts are made on a monthly basis for both 2017&2018. The forecasts for 2017 will determine the forecast accuracy of the regression models and the forecasts for 2018 will provide comparisons to the benchmark 2% target rate. The Root Mean Square Error (RMSE) is used to measure forecast accuracy. The time trend regression models are fitted to the monthly CPI data for 2009-2016 and 2009-2017.

### **Job Searching for Higher Education Students in a Highly Digitized World: The Role Social Media Plays in Finding a Full-Time Position**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Course Project, 201780 EDC 540 D1

**PRESENTERS** Brittany Ann Fishburn

**ADVISORS** Graham F Hunter

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This project aims to explain the role that social media plays in college students finding a job upon graduation. It addresses whether or not recruiters and organizations use social media as a viable method to fill open positions. It also conveys whether or not LinkedIn is still a relevant social media platform and if other social media outlets, such as BeBee, can be used for the job search process. The research was conducted by synthesizing information from peer-reviewed scholarly articles for a graduate course at the University of Dayton titled EDC 540 Perspectives in Higher Education. In the end, it is clear that social networking should not be ignored during the job search. Recruiters are utilizing social media to conduct a pre-check on candidates, post jobs, and make connections with potential candidates. Despite the popularity and usefulness of social networking sites for student to find a full-time position, traditional internet job boards, such as careerbuilder.com and indeed.com are still a top priority (Nikolaou, 2014). Essentially, social networking sites are important to utilize, but should only be one of the many tools used when looking for job opportunities. Keywords: LinkedIn, Job Search, BeBee, Social Networks

## **Perceptions of Short-Term Study Abroad Experiences on Intercultural Competence in School Psychology Graduate Students**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Nicole Anne Guzman

**ADVISORS** Susan C Davies

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Intercultural competence is an emerging topic of interest in service-based professions, including school psychology. The National Association of School Psychologists has long asserted the importance of interculturally competent practices in schools in the form of ethical and unbiased assessments and interventions, collaboration with families, and overall justice and advocacy for all students. Research indicates that participating in a study abroad experience is an accessible option for future professionals in schools to gain intercultural competence. Previous research examined the impact of study abroad experiences on future teachers and school counselors, but little has been researched on the impact of study abroad on school psychologists, who serve diverse student groups. This qualitative project examined the unique experiences and perceived intercultural competence growth of school psychology graduate students who participated in study abroad experiences, as well as their perceived preparedness to serve diverse populations in schools. Implications regarding future research are provided.

## **The Rainbow Connection: Fostering Inclusivity, Empowerment, and Advocacy for LGBTQ+ Students through Staff Professional Development & Student Psychoeducation**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Andrew Jay Rock

**ADVISORS** Brenda S Gerhardt, Layla J Kurt

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

LGBTQ+ students, an often overlooked group within our schools' diverse populations, have unique needs. This action research has been focused on these academic and social-emotional needs and the ways in which they can be addressed at the macro and micro levels. The intended objective of the research project was to explore ways to support LGBTQ+ youth in a heteronormative, and at times, homophobic educational environment. However, upon further investigation it became evident that, in addition to student psychoeducation and LGBTQ+ affirmative care, staff education and professional development are lacking in the schools. These findings have led to the creation of an ensemble of practical resources for students and school staff; a series of professional development workshops, and the initiation of an advocacy-based, fictional novel series for LGBTQ+ adolescents and the adults working with them.

## **Exploring the knowledge and attitudes toward concussions among college football players**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Ian James Chennell, Megan Irene Grace, Marissa Ann Melaragno, Jamie Grace Squillante

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There have been increasing concerns on the issue of concussion in the world of football. The concussion effects are becoming more evident as the players get older and the more technology grows. Because of this, we wanted to look into the knowledge level and attitudes about concussions. Our study looks at multiple college football players and what their knowledge level and attitudes are about concussions. We will measure this by conducting interviews and administering surveys based on "Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS)". We also took aspects of the Planned Behavior Theory and related them to our findings. The Planned Behavior Theory looks at an individual's drive and motivation to engage in a specific behavior. Specifically, we are interested in seeing if the knowledge level or attitudes about football among college football players would play a part in their athletic performance.

## Interference of the Inflammasome Via Interferon-Beta

School of Education and Health Sciences: Health and Sport Science

Poster - Honors Thesis

**PRESENTERS** Maddie Ann Sauer

**ADVISORS** Anne R Crecelius, Dr. Joel Schilling, M.D., Ph.D.

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

It is well established that macrophages, a classification of white blood cells, are the body's first line of defense against stressors such as bacterial and viral infections. The inflammatory response is adaptive and is the body's way of fighting anything that would be considered foreign, and therefore potentially dangerous to the human body. This project looks at metabolic diseases, such as obesity and type 2 diabetes mellitus (T2DM), and the pro-inflammatory phenotype. The pro-inflammatory phenotype is a physical manifestation of the molecular changes that take place due to the high fat environment associated with metabolic diseases. This inflammatory response has been associated with not only metabolic disorder, but also Alzheimer's Disease, atherosclerosis, autoinflammatory/ autoimmune diseases, gout, inhibited tissue repair and creation of tumors. This project aims to assess a specific protein called PPAR-B that, when absent, has been shown to decrease this pro-inflammatory response. If the mechanism behind how this protein works to decrease the inflammatory response can be established, it could be used clinically to treat many of the inflammatory conditions. It is hypothesized that that in the absence of PPAR-Gamma a signaling molecule called IFN-Beta is increased, leading to the anti-inflammatory response. It is unknown how IFN-Beta and PPAR-Gamma are linked mechanistically. Through this research, we hope to establish the link between these two molecules. If this novel mechanism can be established, it can be used therapeutically to decrease the pro-inflammatory response.

## The Effect of Quadriceps Strength on Abnormal Movement Patterns After ACL Reconstruction; A Systematic Review

School of Education and Health Sciences: Health and Sport Science

Poster - Honors Thesis

**PRESENTERS** Mark D Bugada

**ADVISORS** Anne R Crecelius, Mark Paterno, PT, PhD, MBA, SCS, ATC, Catherine Quatman-Yates, PT, DPT, PhD

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The current literature is replete with evidence of quadriceps femoris strength deficits after anterior cruciate ligament reconstruction (ACLR), but there is a lack of clear understanding about its relationship to movement patterns following ACLR. Elucidating the role of quadriceps strength relative to movement patterns is a vital step for improving the rehabilitation process. As a systematic review, this study aims to identify, assess, and synthesize the evidence regarding the relationship between quadriceps femoris strength and abnormal movement patterns in patients after ACLR. To achieve this, PubMed and EBSCOhost (SPORTDiscus) databases were searched to identify studies for this review based on the following eligibility criteria: 1) available in English, 2) human subjects following an ACLR, and 3) original research examining the relationship between quadriceps femoris strength and dynamic movement patterns. From these criteria, the reviewed articles were selected, data was extracted, and results were synthesized to draw conclusions. This study found that the majority of the literature on this topic shows that quadriceps strength is related to abnormal movement patterns, with increasing strength leading to increasing in performance or decreases in asymmetry. However, the results yielded variable outcomes for lower dynamic patterns, such as walking gait, and patterns where body positioning has a greater impact on the results, like the horizontal hop and Y-Balance tests. The results of this systematic review increases understanding on the information in present literature on how quadriceps femoris strength deficits after ACLR affect movement patterns following ACLR. Understanding this relationship is vital for clinicians to develop and improve rehabilitation protocols to increase success in patient outcome.

## Assessing Adequate Caloric, Macronutrient, and Micronutrient Intake in College Athletes of Various Sports

School of Education and Health Sciences: Health and Sport Science

Poster - Independent Research

**PRESENTERS** Hannah M Boyer, Ashley Briana Marolo, Abby Louise Vichill

**ADVISORS** Diana Cuy Castellanos

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Adequate micro- and macronutrient intakes are important for optimal athlete performance and recovery and decreased risk of injury. However, research suggests collegiate athletes often have suboptimal intakes of calories and nutrients such as calcium, vitamin D and iron. The purpose of this study was to examine the actual dietary intake to estimated need of calories and micro- and macronutrients of collegiate athletes across different sports at a Division I private university. Athletes from football, cross country, volleyball and track competed a three-day food record and 7-day physical activity log. Resting metabolic rate was determined through indirect calorimetry using a Medgem. Caloric need for each athlete was determined by adding the resting metabolic rate, calculated METS from exercise training, and physical activity and thermic effect of food factors. Macronutrient need for each athlete was calculated using determined grams/kg +/-10% based on the sport and compared to the calculated calories to ensure appropriate macronutrient distribution. Lastly, micronutrient intake was compared to the RDA for gender and age. The information from each three-day

food record was entered into the Nutrient Database System for Research to obtain measures of each athletes' calories and macro- and micronutrients consumed. Frequencies and Chi-square analyses were utilized to examine dietary adequacy across gender. Fourteen male and 8 female athletes participated in the study. All athletes were under the calculated need for carbohydrates with 31% not obtaining adequate fat and 36% under for protein. More than 50% were under the RDA for fiber, vitamin D and potassium. In terms of gender, girls were more likely than boys to be under for iron but over for fiber. In conclusion, nutrition education and careful dietary planning should be a focus within the college athletic arena to encourage adequate nutrient intake and optimal athletic performance.

### **Motivation Factors that Affect the Usage of the Recreation Facility by College Students**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Megan Rose Ellis, Kelly Ann Evers, Samantha Kaye Isidro, Jac Nicole Reamsnyder

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Studies have shown that this current generation of young adults is one of the least active when compared to other age groups. Most of these young adults are college-aged students with busy, stressful lives who cannot find the time to use recreation facilities. A main issue in research is that physical activity has declined and that there are surrounding factors that influence this. This study will focus on the primary motivation factors for physical activity participation in hopes of highlighting what motivate college-aged students to prioritize their health and fitness. A survey will be conducted and sent out to students who use the recreation facilities at the University of Dayton. Specifically, we will focus on measuring a variety of motivation factors, which includes social reasons, health benefits, weight management, self-confidence, competition, etc. The research findings will not only help us better understand the motivations behind the physical activity participation among UD students, it will also be beneficial to the UD Campus Recreation by allowing them to better satisfy the needs of their student clients.

### **ACL Reconstruction Graft Types and the Effects on Recovery Time in Young Adults**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Megan Marie Gusky, Chrissy Hannigan Marie Hannigan, Daniel Vincent Passafiume, Michael Louis Valenti

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This study focuses on ACL Reconstruction Graft Types and The Effects on Recovery Time of Young Adults. There has been a large increase in ACL tears amongst both males and females recently and there are multiple different graft types that can be chosen from for repair. These options include autografts and allografts. Autografts consist of using a tendon from the patient's own body, which could include: a patellar tendon graft, a hamstring graft or a quadriceps graft. An allograft involves using a tendon that is taken from a source outside of the patient's own body. A cadaver is a common source for an allograft. The different graft types can result in different recovery times. Quantitative data is used to see the correlation between the graft the subjects chose and the overall recovery time. Therefore, students currently attending the University of Dayton will be informed about this study and asked to volunteer if they have previously torn their ACL and have had surgery to repair it. The goal of this research is to figure out which graft type used in ACL reconstruction surgery leads to the quickest recovery for both males and females. This study assesses why the subjects chose the particular graft that they did, what their experiences were during the rehabilitation process, how long it took them to recover from surgery and if they still have any problems with their knee currently.

### **The Effect of Music Tempo on Running Performance in College Students**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Christian Umberto Fay, Chelsea Renee Jones, Alexandra Nicole Malsch, Megan Estelle Murray

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This research aims to determine a relationship between music tempo and running performance. It has been concluded that the presence of music correlates with lower rating of perceived exertion and more positive affect than the absence of music (Hutchinson, Karageorghis, & Jones, 2014). The findings of this study would be of interest to any college student interested in learning whether his or her music choice can improve running performance. Participants will complete three, one mile runs, each with a randomly assigned condition. The conditions include listening to fast tempo music, slow tempo music, or no music. The pace of a fast-tempo song is measured at 200 beats per minute and the pace of a slow-tempo song is measured at 70 beats per minute (Edworthy & Waring, 2006). Athletic performance will be assessed by measuring mile time, rating of perceived exertion using the Borg scale, and post-workout heart rate. We hypothesize that the higher-tempo music will result in the participant to perform better on their running pace. The study is in progress and the findings will be reported at the symposium.

### **The Effect of Music on Running Pace, Heart Rate and Rating of Perceived Exertion (RPE)**



## School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 428 02

**PRESENTERS** Alyssa Kathleen Boman, Mitchell Leonard Hester, Olivia Kathleen Lizanich, Megan Elizabeth Nemecek

**ADVISORS** Haozhou Pu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The purpose of this study is to investigate how music affects different exercise variables. The variables that are being compared are running pace, heart rate, and the rate of perceived exertion. These variables will be compared when the subjects listen to music and when they do not listen to music during exercise. The goal of this study is to find out if music has a profound effect on overall athletic performance. This investigation is important for people who currently exercise often, those who are looking to lose weight as well as those who are looking to begin exercise programs for the first time. By comparing the effect of listening to music to the effect of not listening to any music on running pace, RPE and heart rate, both the benefits and setbacks of running with or without music will be presented. This, in turn, will allow us to find improvements for exercise/training and ways to improve running pace while keeping RPE low. In order to carry out this investigation, 20 students will run ½ mile while listening to “Call on Me - Ryan Riback Remix” on one day and run ½ mile without any music on a different day. Their ½ mile times, heart rate and RPE will be recorded each day following the run. The data will be collected from college students and the results will be compared. Once the data is compiled and analyzed, it will either confirm or deny the hypothesis that music will have a positive effect on running pace, heart rate and rate of perceived exertion.

## Factors that Affect Students in an Urban Educational Setting

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Jack M Dalton, Natalie Grace Kremer, Brittany K Mason, Grace C Takacs

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation explores how factors such as grade retention, food insecurity, drug use, and the school-to-prison pipeline affect students in an urban educational setting.

## The Integration of Spirituality, Movement, and Cursive to Enhance Learning

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Emma Grace Geckle, Carolyn M Karutz, Jennifer Anne Malashevitz

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will examine spirituality, movement, and cursive writing in the classroom and its effects on the learning environment. Benefits and consequences of each classroom initiative that influences learning will be reviewed. The findings in this study could influence instruction in K-12 education.

## Parental Involvement and External Factors that Influence Academic Success

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Erin Marie Colbert, Claire N Evans, Megan Jane Stefan

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation explores how student success is affected by parental involvement, and addresses external factors such as single-parent households and cultural backgrounds.

## It's Time to Take a Second Look

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Megan McCarren, Karl L Rimelspach

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will examine the structure of the school day. Specifically, we will examine the effects of school start time on students, as well as the presence of having a lunch hour. The positives and negatives of both sides will be looked at in order to determine how to structure the best possible school day for students.

## The Effectiveness of Standardized Testing as an Analytical Tool for Various Purposes

**School of Education and Health Sciences: Teacher Education**

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Gregory James Duchak, Kathleen C Gross, Logan M. Symons**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This project analyzes the relative strengths and weaknesses of standardized testing as a tool to analyze student achievement and success. The effectiveness of standardized testing in the sectors of merit pay, college admissions and intelligence levels will be discussed, as well as the effectiveness of standardized testing in general.

**Educating ELLs Beyond the Regular Classroom****School of Education and Health Sciences: Teacher Education**

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Michaela Michaela Rogan**ADVISORS** Rachel M B Collopy**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Currently, there are around five million ELLs in the public school system of the United States. To be successful, many English Language Learners (ELLs) may need additional opportunities for instruction outside of the regular school day. After observing at El Puente, an after-school program for ELLs, I wanted to learn more about what makes the programs effective for ELLs. I conducted a review of the research literature to determine which strategies make the after-school programs for ELLs successful. In order to effectively support ELLs after-school, the programs need to utilize the student's primary language, engage the parents/families in the process, have the instructors collaborate, allow time to practice what is taught, conduct the after-school session at a school but in an informal environment, and create unique ways of learning.

**Promoting Academic Achievement and Intrinsic Motivation in Mathematically Gifted Elementary Students****School of Education and Health Sciences: Teacher Education**

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Sarah Elizabeth Rolfsen**ADVISORS** Rachel M B Collopy**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Most often, the mathematically gifted student is the most neglected in an elementary classroom. Though there is very little available research on this topic, this paper will explore the available structures, programs, and strategies aimed to support mathematically gifted elementary students in both academic achievement and intrinsic motivation. Through analyzing studies involving structures such as the cluster model, distance learning, and the pull-out method, and programs such as Accelerated Math, Project M2, and Project M3, specific strategies that seem to be a common theme are identified. These strategies should be implemented in classrooms to cater to these gifted students; for they have proven positive effects on academic achievement, and often times, motivation. Though more research must be done on this topic, there seems to be a strong potential for using these structures, programs, and strategies to promote mathematical achievement among young gifted students.

**Implicit Bias****School of Education and Health Sciences: Teacher Education**

Poster - Course Project

**PRESENTERS** Samantha Amanda Mack**ADVISORS** Rachel M B Collopy**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This poster presentation works to define implicit bias, provide strategies of dismantling these assumptions in the classroom setting, and connecting it to the experience of English Language Learners (ELLs) and ELLs with Individualized Education Programs (IEPs). There is a personal connection as I identified my own implicit bias towards disabilities, and these statistics were used to help explain the way in which we can create change for the future generation, our students. Many techniques relate to personal awareness, curriculum contexts, and the importance of understanding and identifying implicit bias in ourselves. Though becoming educated on implicit biases is the first step in creating a change in our behaviors, motivation is also a significant factor. Once motivated, the strategies incorporated into this literature review work as tools to promote an open-minded and culturally aware classroom.

**Positive Behavior Intervention and Support****School of Education and Health Sciences: Teacher Education**

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Mary Eileen Schultz**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Behavioral issues or lack of social skills can be a huge distraction to one's learning or daily life. All teachers should have a technique to not only handle but change challenging behaviors. One strategy that can be used is positive behavior intervention and support (PBIS) is an intervention used mainly with people who experience challenging behaviors. In this review of the research literature, I pursue the question what context does PBIS work most effectively in. It can be used on an individual or class wide level, offering different levels of support based on student's needs. It helps to teach self regulation and the use of appropriate behaviors. On a class wide level, it can help students with mild to severe behavior problems or those who lack social skills. PBIS tends to sustain positive outcomes over time, except in small group instruction set in a class wide intervention.

## **The Importance of Technology in the Classroom for English Language Learners**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Brittany Nicole Resar

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There are various forms of technology that can benefit English Language Learners' (ELLs) success in the classroom. This literature review explores three forms of technology: interactive white boards, iPads, and computer technology and how these forms of technology can impact ELL students in the classroom. Interactive white boards can be used to provide images and videos to help ELLs learn vocabulary terms, as well as giving the entire class the same opportunity to engage with technology. When ELLs use iPads, they can work at their own pace and use a variety of features on the iPad to support their learning, such as a translator. Computer technology supplements the learning of ELLs because of a wide range of available software and computer programs. The ability to use technology to advance learning also provides motivation and new experiences for the students to keep them engaged. However, teachers must ensure that the technology is enhancing the learning of the ELL students. Some issues that teachers might face include a lack of resources, difficulty incorporating the technology into the curriculum, and language barriers when students try to understand instructions while using the technology.

## **Identifying and Responding to Mental Health in Schools and the Effects on Student Achievement**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Jordan K Bailes, Allison N Karrenbauer, Meghan Mae McDonald

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

With an increasing awareness of mental health issue in students, identification of the effects on student achievement and social life are important to success. Schools are beginning to question their role in identifying and helping students reach their full potential. Furthermore, research shows that stress and test anxiety affect all aspects of schools and it is the school's responsibility to address these issues.

## **Dress Code Inside and Outside of the Classroom**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Caroline G Fahey, Jordan Lee Trenkamp

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will analyze dress code effects of academics, influence of the surrounding environment, and the argument for each position on the policy. Clothes are often a form of self-expression that help describe a person's personality and culture. This presentation will explore reasons for dress code policies and conditions people feel a dress code is unreasonable and why.

## **Mentoring Strategies for the Support of High School Students Experiencing Anxiety and Depression: A Case-Study of Two Catholic High Schools**

School of Education and Health Sciences: Teacher Education

Poster - Honors Thesis

**PRESENTERS** Karin Elaine Forsthoefel

**ADVISORS** Mary Catherine Sableski

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a high prevalence of anxiety and depressive related disorders among adolescents ages 13-18 in the United States, and these statistics do not include the undiagnosed experiences of anxiety and depression that are typical during adolescence. This case study examines the supports provided for students experiencing anxiety and depression in two Catholic high schools. The aims of the

study were to collect a list of strategies and interventions being used in Catholic high schools to address the needs of high school students experiencing anxiety and depression, and to investigate the use of mentoring opportunities through which teacher-student relationships can be developed. Faculty and staff members were surveyed and interviewed to gather specific information about strategies and mentoring opportunities employed. Themes among the data include the teacher roles of seeking knowledge, collaborating with parents and staff, modeling healthy coping strategies, and creating supportive environments to foster student openness.

### **Support and Opposition to the Integration of Technology in the Classroom**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Nicholas Mark Bennett, Madison L Borchers, Greta E Drager, Samuel J Enderby

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

As technology continues to become more prevalent in our everyday lives, it is also growing increasingly popular in the world of education. This presentation will focus on the advantages and disadvantages of incorporating technology into classrooms, with a special emphasis on its role in student engagement.

### **Exploring Issues Pertaining to Bilingual Education**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201810 EDT 110 H1

**PRESENTERS** Natalie Elizabeth Blank, Taylor Lou Flight

**ADVISORS** Susan M Ferguson, Kathryn A Kinnucan-Welsch

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This presentation will discuss the tactics and overall benefits of bilingual and immersive education. In addition, cost and accessibility of these types of programs will be discussed.

### **The Impact of Visual Aids for English Language Learners**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Sarah Mary Scoville

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

English Language Learners have a unique set of learning needs and learning challenges. This review of the research literature explores addressing those needs by using visual aids. The guiding research question is how do the various types of visual aids influence English Language Learners? Visual aids can come in numerous forms and be used for all ages. Visual aids help students by scaffolding and encouraging increase in self-esteem. Students perform better when using visual aids and overall benefit from them personally and academically.

### **Reading and Vocabulary Strategies for Students with Learning Disabilities**

School of Education and Health Sciences: Teacher Education

Poster - Course Project, 201780 EDT 340 H1

**PRESENTERS** Claire Elizabeth Grabowski

**ADVISORS** Rachel M B Collopy

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Literacy skills affect every other subject, making literacy skills crucial to success in school. Educators need to know what factors contribute to the success of reading and vocabulary strategy for students with learning disabilities. My analysis of the research literature found many effective strategies incorporate four common factors: regularly checking understanding, being easily individualized, asking clarifying questions, and providing the student with a study buddy or study group.

### **Design of an Enhanced Cellular Model for the Assessment and Tracking of Nanomaterials**

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Maggie Elizabeth Jewett

**ADVISORS** Kristen Krupa Comfort

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Due to their unique physicochemical properties nanomaterial (NM)-based technologies are growing exponentially in scope and economic importance. This surge is resulting in significant degrees of NM waste and increased rates of human exposure. This has created a vital need to fully understand the potential biological consequences of NM exposure, characterize resulting NM-biological

interfaces, and determine subsequent toxicological effects. The long-term goal of this project is to design, optimize, and implement an enhanced microenvironment model (EMM) to bridge this in vitro – in vivo gap and evaluate NM characteristics, pharmacokinetic/deposition profiles, and induced biological responses under physiologically relevant conditions. To date efforts have focused on the generation of the EMM which uses a perfusion plate platform containing cellular compartments interconnected by dynamic fluid movement produced via a peristaltic pump. While the EMM system can be tailored to any target organ/tissue, this proposal is focused on the flow of NMs from lungs (A549; human alveolar epithelial) to liver (HepG2; human epithelial) to skin (HaCaT; human keratinocyte), as inhalation is a primary form of exposure and NMs have been shown to accumulate in the skin. Additionally, the human monocyte (U937) cell line will circulate through all compartments allowing for immune analysis. Once complete and optimized this EMM system will be one of the first non-microfluidic models to simultaneously incorporate physiological influences and multiple cellular compartments to improve relevance and promote in vivo-like behavior.

## The Effect of Porosity on Short Beam Shear Strength of Fiberglass Composites

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Kyle Alexander Lach

**ADVISORS** Charles E Browning, Donald A Klosterman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The presence of porosity is a well known and difficult-to-avoid defect in laminated composite materials. Excessive porosity can significantly reduce the mechanical properties of composite structures and is therefore a source of concern. In this study we investigated methods of preparing fiberglass/epoxy composite panels with the goal of being able to control the amount of porosity in the final panel, e.g. some panels with low porosity, some with high porosity. The panels were then tested for short beam shear strength, which is a property that is usually heavily influenced by interlaminar porosity. Our results indicated that, for the material system tested, the strength values were reduced only when the amount of porosity achieved a very high level. This implies that a low level of porosity can be tolerated with this material system.

## Performance Characterization of the GS-4 Gas Induction Impeller

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Shannon Marie Hoffman

**ADVISORS** Kevin J Myers, Eric E. Janz (NOV Mixing Technologies)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

High interphase contact is essential to processes involving gas-liquid reactions, and can be accomplished using gas dispersion or gas induction. In gas dispersion, gas is sparged into the vessel below the impeller, and then dispersed throughout the liquid by agitation. Gas induction is an alternative approach, which uses a hollow impeller and shaft to draw gas into the liquid phase and distribute it throughout the vessel. The GS-4 impeller is a novel gas induction impeller that is unique due to its large openings in the impeller blades and generation of an axial flow pattern. This impeller is characterized based on the power number, pressure coefficient, and modeling of the induced gas flow rate. The power number at ungasged conditions is independent of impeller size and submergence, but is higher when up-pumping than down-pumping. This parameter decreases as gas is induced, and is modeled using the relative power number as a function of the relative speed. The pressure coefficient is examined using two approaches, one using speeds below the onset of induction and the other using the critical speed. Comparison of these methods shows that the pressure coefficient is more accurately determined independently of the minimum induction speed. This information is used to relate the available pressure difference to the gas flow rate. This relationship is affected by impeller diameter, with larger impellers inducing a higher flow rate than smaller impellers for a given pressure difference. The accuracy of this model is improved by assuming that the gas flow rate is also a function of the gas-liquid contact area within the impeller.

## Study of Lithium Intercalation towards the Development of an Electrochemical Kinetic Model for Lithium/Copper Phthalocyanine Cell

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Clayton Jerrel Cashion

**ADVISORS** Sarwan S Sandhu

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The development of high capacity batteries is necessary to increase the viability of renewable energy sources by providing efficient storage of excess energy. Therefore, currently the lithium ion batteries, with high charge storage capacity, are being further developed. In a lithium ion battery a reversible lithiated graphite is used rather than solid lithium as an anode. Research into high charge-storage capacity cells focuses on the cathode. Experimental investigations into high charge-storage capacity cathode active materials have indicated that copper phthalocyanine is one such material. Previous work involving copper phthalocyanine or other metal phthalocyanines has indicated that solid phase mass transport has a limiting effect on the lithium intercalation process, which is key to the operation of lithium ion batteries. Some models have been developed to describe the observed cell behavior, but the system is not yet fully understood. To ensure that the model formulation will best describe observable data, a literature search into

lithium intercalation was conducted. A summary of the available understanding of this process and how we can apply this knowledge to the development of a lithium-ion battery with copper phthalocyanine as cathode active material is presented.

### **Electrokinetic Desalination of Kaolin Soil with Acetic Acid**

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Ronald Christopher Knapp

**ADVISORS** Robert J Wilkens, Christopher Athmer (Terran Corporation)

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Sodium and chloride both dissolve in water and are carried into the ground by precipitation runoff. This runoff pollutes the soil, negatively impacting wildlife and vegetation. The use of electrokinetic remediation (EKR) techniques has been demonstrated to remove salt, heavy metals, and other contaminants from soil. One issue during the process is that chloride ions buildup near the anode, and are not removed. This experiment was performed to determine if using acetic acid as the cathode fluid during EKR would remove this buildup and increase the total amount of chloride removed. Three acrylic tubes were packed with kaolin clay with an initial concentration of 8000ppm NaCl. Each tube used tap water as the anode purge solution. The cathode purge solution was initially tap water; after two days, the purge solution for Tubes 2 and 3 were switched to 0.1M acetic acid and 0.5M acetic acid, respectively. The electrodes were flushed at a rate of 50.00?L/min. The tubes were hooked up to a DC power source providing 15V for 11.5 days. Ion selective electrodes, a spear-tipped pH probe, and a handheld multi-meter were used to collect data. 55.8% of the chloride ions were removed from Tube 1, 56.7% from Tube 2, and 53.1% from Tube 3. Tube 3 also had the greatest concentration of chloride ions remaining near the anode at 9220ppm. As the concentration of acetic acid increased, the amount of chloride remaining near the anode increased. The use of acetic acid did not affect the overall removal of chloride ions.

### **Thermal Engineering for Flexible, High-Power Electronics**

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Katherine Morris Burzynski

**ADDITIONAL AUTHORS** E. W. Blanton, N. R. Glavin, E. R. Heller, M. Snure, E. Heckman (WPAFB Research Laboratory); C. Muratore (University of Dayton)

**ADVISORS** Christopher Muratore

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Consumers and military personnel are demanding faster data speeds only available through fifth generation (5G) wireless communication technology. Furthermore, as wearable sensors and other devices become more ubiquitous, devices demonstrating enhanced flexibility and conformality are necessary. The challenge is to enable electronic devices to withstand strain and continue to operate within an acceptable tolerance to ensure reliability. A fundamental challenge for flexible electronics is thermal management. Even on rigid substrates with 100 times higher thermal conductivity than polymeric and other flexible substrates, the full potential of semiconducting materials is often thermally limited. The flexible gallium nitride (GaN) high electron mobility transistors (HEMTs) employed in this work are grown on a two-dimensional boron nitride (BN) release layer that allows the conventionally processed devices on sapphire wafers to be transferred using a polymeric stamp and placed onto a variety of rigid and flexible substrates. Characterization of the GaN device behavior on the as-grown sapphire wafers (not transferred) provide a baseline for evaluation of the thermal performance. Transferring the GaN devices to flexible substrates enables application of strain during device operation; however, device performance typically suffers due to the low thermal conductivity of most polymeric substrates, requiring more advanced schemes to remove waste heat from device operation. In situ thermal imaging of devices in operation reveals that the current passing through a non-transferred GaN transistor on a sapphire wafer reaches the target operating temperature at twice the current of the same device transferred to a flexible substrate. Packaging environment simulations and consideration of device-substrate interfacial thermal effects allow for an understanding of how the flexible GaN devices operate after they are transferred to a substrate and show the path forward for substrate design to reduce thermal limitation of high-power flexible electronics.

### **Real-time camera tracking and 3D scene reconstruction based on pose graph**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ruixu Liu

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The 3D reconstructed maps can be used in many applications such as robot navigation, augmented reality and virtual reality. 3D maps for the environment has been developed using RGB-D sensor data that provides color and depth information. RGB-D camera noise, fast camera movement, and rotation introduce drift in the reconstructed 3D maps. If the scale of the 3D model increases, the drift error is also accumulated which can affect the final 3D model performance. A good way to reduce the drift is loop closure detection which is based on visual place recognition. It is an extremely challenging problem to solve in the general sense. First, a place recognition system must have an internal representation of a map of the environment to compare to the incoming visual data. Second, the place recognition system must report a brief about whether or not the current visual information is a place already

included in the map, and if so, which one. If the loop closure detects successful, we could use the loop closure pose to correct current camera pose to enhance the camera tracking accuracy and 3D model performance.

## Development of the Numerical Attenuation Factor for a Spiral Antenna affected by Spurious Modes

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Joseph Vinci

**ADVISORS** Robert P Penno

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

This poster details the work performed in the 2017 SURE Program under Dr. Robert Penno. The objective is to improve Dr. Penno's model for the four arm, Archimedian spiral antenna in the presence of spurious modes by developing an attenuation constant. This constant is derived from the principles of a transmission line with shunt loads in the place of the arms of the antenna with spurious modes. The results are prepared to be analysed by Dr. Penno and the effectiveness of the constants on the radiation pattern of the antenna will be examined in future work.

## An Efficient Leaf Recognition Based Approach for Plant Classification Using Machine Vision Strategy

School of Engineering: Electrical and Computer Engineering

Poster - Course Project, 201780 ECE 695 04

**PRESENTERS** Redha Ali, Russell C Hardie

**ADVISORS** Russell C Hardie

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The identification of plants is very important component of workflows in plant ecological research. Therefore, in this work, we are developing a novel automatic leaf recognition for plant classification. Unlike the existing techniques, our approach is efficient, fast, and simple. The proposed method is based on machine vision strategy that employs two main processing stages: 1) the Bag of Feature (BoF) approach, and 2) a decision-making model based on multiclass Support Vector Machine (SVM) classifier. The BoF is utilized for extracting the features from representative images. First, to provides excellent scale invariance break up the image into sub-regions by using speeded up robust features (SURF) detector. Then, compute the histogram of local detected features inside each sub-region. After that to create the visual words and to reduce the number of features, the K-means clustering approach is applied. The final sets of features are fed to a decision-making model based SVM classifier for automatic plant identification. Experimental results on several publicly available leaf datasets demonstrate that the effectiveness of the proposed method for plant classification compared to a set of state-of-the-art methods.

## Study of Electrolyte/Electrodes Interface Engineering in Solid State Lithium-Ion Batteries

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ashish Gogia

**ADDITIONAL AUTHORS** Priyanka Bhattacharya, Badri Shyam

**ADVISORS** Jitendra Kumar, Guru Subramanyam

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a growing need for high energy, high power and safe lithium batteries for myriads of applications in powering microelectronic devices (such as smart cards, implantable medical devices, wearable electronics) to large power applications such as electric vehicles, aerospace and space equipments. One key requirement for such batteries is packing high energy in low form factor (i.e. thin-film form) to increase both the gravimetric and volumetric energy densities. Lithium superionic conducting solid ceramic electrolytes are the most prominent candidates amongst liquid, gel, polymer and solid ceramic electrolytes that can enable safety and optimum performance in a high energy density battery with thin-film cell components. For example, lithium aluminum germanium phosphate (LAGP) has been proven to be a promising solid-electrolyte due to its high ionic conductivity ( $\sim 5$  mS/cm at 23 °C), high electrochemical stability window ( $> 5$ V), and single  $\text{Li}^+$  ion conduction (high transference number, no dendrite formation, no crossover of electrode materials), thus enabling high energy battery chemistries and mitigating safety and packaging issues of conventional lithium batteries. However, application of solid-electrolyte (LAGP and others) in Li batteries is being hindered by lack of understanding of thin-film fabrication techniques/parameters, mechanical stability, and poor stability between solid ceramic electrolyte and electrodes, especially with Li metal anode. Low chemical stability between solid electrolyte and Li electrodes forms resistive interface (lower conductivity) which is detrimental for high power and cell longevity. We present materials and methods for electrolyte/electrode interface engineering that have shown promise but need further investigation. One such promising stable interface material is lithium phosphorus oxynitride (LiPON), when introduced as thin-film in between LAGP and Li reduces interface resistance (increase conductivity) considerably. Details on material's thin-film fabrication techniques such as sputtering, physical vapor depositions, etc. and their resultant effects on solid-state battery performance will be presented.

## Authentication Of the Internet of Things Devices Over ZigBee Networks

**School of Engineering: Electrical and Computer Engineering**

Poster - Independent Research

**PRESENTERS** James Patrick Althoff**ADVISORS** Feng Ye**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

IOT, or the Internet of Things, is the inter-networking smart devices, buildings and other embedded systems to enable them to transfer data between them. This data can be used for various uses such as power management and home automation. Current projections of the Internet of Things predicate that the use of this technology will increase dramatically within the foreseeable future. Many of these devices are currently being implemented using protocol such as Bluetooth and ZigBee. ZigBee is a wireless communication protocol based on the IEEE 802.11.4 standard. ZigBee was created for low power devices, such as those that run on batteries, with the industrial settings being among the common implementation of ZigBee enabled devices. The project focuses on improving the ZigBee protocol, specifically in the authentication section of the protocol.

**Multi-Feature Fusion Approach for Object Classification on Oil/Gas Pipeline Right-of-Ways**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ming Gong**ADVISORS** Vijayan K Asari, Almabrok Essa**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Pipeline right of way (ROW) monitoring and safety pre-warning is a vital way to guarantee safe operation of the oil/gas transportation. Any construction equipment or heavy vehicle intrusion is a potential safety hazard to the pipeline infrastructure. Therefore, we propose a novel technique that can detect and classify any intrusion on oil/gas pipeline ROW. The detection part has been done based on our previous work, where we built a robust feature set to represent an object from two parts. Firstly, we divide an image into two circular regions with linearly increasing areas and pyramid levels. Then the histogram of the local feature is extracted for each sub-region and in multiple pyramid levels. After that a support vector machine with radial basis kernel is used to detect objects. For the classification part, the object can be represented by a robust fusion feature set, which is a combination of three different feature extraction techniques, histogram of oriented gradient (HOG), local binary pattern (LBP), and the color histogram of HSV (hue, saturation, value). Then a decision making model based support vector machine classifier is utilized for automatic object identification. It is observed that the proposed method provides promising results in identifying the objects that are present on the oil/gas pipeline ROW.

**Aircraft Generator Design and Analysis**

School of Engineering: Electrical and Computer Engineering

Poster - Honors Thesis

**PRESENTERS** David Gross**ADVISORS** Kevin Yost (WPAFB Research Laboratory), Guru Subramanyam**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Aircraft electrical power demands have been rapidly growing due to an increased amount of electrical load onboard aircraft. This increased load has come about as electrical sources for various aircraft subsystems, such as pumps, compressors and flight controls, replace mechanical sources. The main source of electrical power on an aircraft is a generator. The power demand on an aircraft is not constant, but rather dynamic, and the nature of these power demands causes increased temperatures and complex/dynamic loads, for which many contemporary generators are not designed. Because of the need for high amounts of reliable electrical power among future aircraft, future generators should be designed for reliability, stability, power density and long-term durability. The objective of this thesis project is to determine if generator sizing techniques (e.g. equations, assumptions, rule-of-thumb metrics) can be calculated to a reasonable accuracy for preliminary machine design optimization and analysis.

**A Survey of Tundra Lake Size Changes During Around 40-year Time Interval Observed in Historical Maps and Satellite Images**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ming Gong**ADVISORS** Vijayan K Asari, Almabrok Essa, Ivan A Sudakov**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Greenhouse gas emissions from tundra lakes are a significant positive feedback to the atmosphere in a changing climate as a pronounced growth of the numbers of tundra lake patterns has been observed in the Arctic region. Detailed knowledge of changes in tundra lakes size is potentially valuable in order to understand and accurately model the sources of greenhouse gas emissions. Therefore, we are using historical maps and satellite images with time interval around 40-year to show a study of tundra lake size changes. We have developed a novel algorithm framework that is employing three main processing stages: lake detection, lake segmentation, and lake size computation. In the first stage of the framework, there are two different approaches, one is for detecting



the lakes on historical maps that is a color-based segmentation technique, and another one is for detecting the lakes from satellite images which is a decision-making model based on support vector machine classifier (SVM). The second stage of the algorithm is a region growing approach that is applied for the detected lakes from both historical maps and satellite images, to segment the actual lake size. The last stage is calculation the lake size which is applied for the final segmented lakes from both historical maps and satellite images. It is based on connected component analysis strategy, which calculates the lake size in terms of number of pixels. Experiments performed on changes in lake size over time in a set of lakes that were visually matched in both the historical map and the satellite imagery demonstrate that some lakes in our study region have increased in size over time, whereas others have decreased in size over time. Lake size change during this time interval can be up to half the size of the lake as recorded in the historical map.

## Optimization of Wireless Electroceutical Dressings in Wound Healing for Burn Victims

School of Engineering: Electrical and Computer Engineering

Poster - Independent Research

**PRESENTERS** Nilan Mani

**ADVISORS** Amy T Neidhard-Doll

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The purpose of the proposed interdisciplinary research is to investigate how the electrochemistry of Wireless Electroceutical Dressings (WEDs) can be optimized to fight infection and promote healing in the wounds of burn victims. One of the most common secondary complications is infection, since bacteria and microbes are able to enter the human body freely in the absence of a protective layer of skin. Infection has been determined to be the leading cause of death in approximately 61% of all reported burn victim cases. Once inside the body, bacteria readily form biofilms to shield themselves from antibiotics and increase resistance to treatment by humans. As a result, an anti-biofilm treatment method is necessary to eliminate the biofilm barrier that currently exists when treating disease. A proof of concept for the nanofabrication of an alternative, Biomimetic Wireless Electroceutical Dressing (BWED) that increases bacteria-disruptive microcurrents through optimization of electrode design (material, geometry, volume, and/or circuitry) will be discussed. This feasibility study entails monitoring the growth of various bacterial colonies cultured from common locations in the environment (e.g. cell phone, door knob, elevator buttons) in the presence of various BWED configurations. The research will attempt to show whether BWEDs work better at decreasing the growth of bacteria colonies when compared to a control group with no BWED present. This information will be used to determine the most promising electrode designs to optimize and fabricate in the future.

## Study of Electrolyte/Electrodes Interface Engineering in Solid State Lithium-Ion Batteries

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ashish Gogia

**ADVISORS** Jitendra Kumar, Guru Subramanyam, Priyanka Bhattacharya, Badri Shyam

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

There is a growing need for high energy, high power and safe lithium batteries for myriads of applications in powering microelectronic devices (such as smart cards, implantable medical devices, wearable electronics) to large power applications such as electric vehicles, aerospace and space equipments. One key requirement for such batteries is packing high energy in low form factor (i.e. thin-film form) to increase both the gravimetric and volumetric energy densities. Lithium superionic conducting solid ceramic electrolytes are the most prominent candidates amongst liquid, gel, polymer and solid ceramic electrolytes that can enable safety and optimum performance in a high energy density battery with thin-film cell components. For example, lithium aluminum germanium phosphate (LAGP) has been proven to be a promising solid-electrolyte due to its high ionic conductivity ( $\sim 5$  mS/cm at 23 °C), high electrochemical stability window ( $> 5$  V), and single Li<sup>+</sup> ion conduction (high transference number, no dendrite formation, no crossover of electrode materials), thus enabling high energy battery chemistries and mitigating safety and packaging issues of conventional lithium batteries. However, application of solid-electrolyte (LAGP and others) in Li batteries is being hindered by lack of understanding of thin-film fabrication techniques/parameters, mechanical stability, and poor stability between solid ceramic electrolyte and electrodes, especially with Li metal anode. Low chemical stability between solid electrolyte and Li electrodes forms resistive interface (lower conductivity) which is detrimental for high power and cell longevity. We present materials and methods for electrolyte/electrode interface engineering that have shown promise but need further investigation. One such promising stable interface material is lithium phosphorus oxynitride (LiPON), when introduced as thin-film in between LAGP and Li reduces interface resistance (increase conductivity) considerably. Details on material's thin-film fabrication techniques such as sputtering, physical vapor depositions, etc. and their resultant effects on solid-state battery performance will be presented.

## A Risk Analysis Framework for Evaluating On-Site Wastewater Treatment Systems

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Alexis Latise Wingfield

**ADVISORS** Kellie R Schneider, Dr. Rodney Williams

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The Beaver Water District in Lowell, AR provides clean, safe drinking water to more than 300,000 residents in Northwest Arkansas. As a water utility, the Beaver Water Department is concerned with the potential of on-site systems (septic tanks) contaminating Beaver Lake – the area's primary source of drinking water. The purpose of this study is to develop a framework to assess the risk potential of on-site wastewater treatment systems in the Beaver Lake Source Water Protection Area. Through a multi-year collaboration, more than 2,400 septic tank permits across two counties have been located, digitized, and used to create a geodatabase. Information from the geodatabase including the geophysical characteristics and system design of each septic tank are considered when assessing a system's risk of contaminating Beaver Lake. Our risk framework, initial risk assessment, and potential intervention areas are presented.

### **Performance Evolution of GPU versus CPU in Iterative algorithms**

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Hassan Ali Alsaad

**ADVISORS** Mohammadjafar Esmaeili

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

High-performance computing is one of the most demanding technologies in today's computational world with a variety of applications such as big data analysis, and solving complex computing algorithm. Engineers have invented multiple technologies such as CPUs, GPUs, GGPUS, FPGAs, clusters and distributed high-performance computational systems for high-performance computing. This research has focused on evaluating GPU and CPU two of the main technologies that could be used in high-performance computing. The researchers have developed a methodology to evaluate the performance of GPU and compare it with CPU under different test subjects. Finally, this research illustrated the power and weaknesses of GPU over the CPU under certain circumstances.

### **Using Strategic Business Process Architecture Models to Create a Process Architecture Reference for the Healthcare Industry**

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Baxter Rechten

**ADVISORS** Sandra L Furterer

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Strategic Business Process Architecture (SBPA) models identify the key elements and their relationships that can be used to document, design and improve operational processes across any process type or industry. The critical SBPA process architecture elements was previously combined with a traditional process map to develop a novel process architecture mapping tool enabling the capture of important elements needed to design streamlined processes. The goal of this research project is to apply the process architecture meta models and the process architecture mapping tool to the healthcare industry, and subsequently develop a standard healthcare process architecture reference model. The process architecture reference model can be used by healthcare organizations as a basis for process management, including to document, design and improve their processes to provide excellent patient care.

### **Data Mining Approach for Estimating Residential Attic Thermal Resistance from Aerial Thermal Imagery, Utility Data, and Housing Data**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Salahaldin Faraj Alshatshati

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Conventional residential building energy auditing needed to identify opportunities for energy savings is expensive and time consuming. On-site energy audits require quantification of envelope U-values, air and duct leakage, and heating and cooling system efficiencies. There is a need to advance lower cost automated approaches, which could include aerial and drive-by thermal imaging at-scale in an effort to measure the building U-value. However, the thermal imaging approaches implemented to date, all based upon thermal-physical models of the envelopes, to estimate the U-values of walls require additional measurements and analysis prohibiting low-cost, at-scale implementation. This research focuses on interpreting aerial thermal images to estimate the U-value of roofs. A thermal-physics model of a ceiling is developed to show the difficulty in using the same approach used by others for walls, as new parameter estimates and thus more measurements would be required. A data-based methodology instead is posed. This approach integrates the inferred roof temperature measurement, historical utility data, and easily accessible or potentially easily accessible housing data. A Random Forest model is developed from a training subset of residences for which the ceiling U-values are known. This model is used to predict the roof U-values in a validation set of houses with unknown U-value. Demonstrated is an ability to estimate the attic/roof U-value with an R-squared value in the range of 0.96 using as few as 24 training houses. The implication of this research is significant, offering the possibility of auditing residences remotely at-scale via aerial and drive-by thermal imaging

### **Determining Recovery Response to Slips on a Slip Trainer**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Stephen Thomas McFadden

**ADVISORS** Kim E Bigelow

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Common injuries in the elderly population often result from slipping or falling. A slip is a loss of balance which may lead to an injurious fall. To counter these falls, proactive balance training, which focuses on preventing slips from occurring through physical therapy and environmental modifications, has been tried with mixed results. Reactive balance training, which can increase how well an individual can recover once their balance is upset by a disruption, is a novel method to decrease injuries from falls. However, current reactive balance training is conducted in academic environments with highly expensive equipment. While this training has proved productive, a need has arisen for this reactive slip training to be helpful in clinical settings and provided at a reduced cost. This project is centered around work to design, build, and test a low-cost slip trainer to measure the recovery response of individuals in terms of a reactive step.

## Analyzing the Factors of Performance: Is There a More Precise Way for Trainers to Score an Individual's Form During Exercises?

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Amanda Nicole Delaney

**ADVISORS** Kim E Bigelow

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

As part of a collaborative project, our overall research aim was to gain a better understanding of factors that contribute to successfully predicting performance in a variable environment. My research concentrated on adding objectivity for evaluating the effectiveness of training exercises and assessments that are performed and normally scored based on an expert's rating. The Lock and Load exercise, which resembles the bird dog exercise but is done in a high plank position, was the focus of this study. Biomechanical marker data was recorded with an Xsens Awinda 17 sensor suit for comparison to the ratings of form assigned by the trainer. Analyzing the center of mass and maximum acceleration of the individual allowed for examination of how well the person was balanced, controlled, and in sync throughout the test. This data was then used to determine the accuracy of the form ratings given by the certified trainer involved in the project. Results suggest that other sensor-based outcomes may need to be incorporated in training exercises to provide a better picture that equates to the expert's rating. Analysis of jerk, hip rotation, and coordination plots are the next steps in determining the relationship between the expert's form rating and the true form.

## Data Mining of Smart WiFi Thermostats to Develop Multiple Zonal Dynamic Energy and Comfort Models of a Residential Building

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Abdulrahman Mubarak Q Alanezi, Kefan Huang

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Smart WiFi thermostats have gained an increasing foothold in the residential building market. The data emerging from these thermostats is transmitted to the cloud. Companies like Nest and Emerson Climate Technologies are attempting to use this data to add value to their customers. This overarching theme establishes the foundation for this research. This research seeks to utilize WiFi data from the Emerson Climate Technologies' Helix test house to: develop a dynamic model to predict real time cooling demand and then apply this model to running 'what-if' thermostat scheduling scenarios with the ultimate goal of reducing energy use in the residence or responding to high demand events. The Helix residence, with two thermostat controlled zones for each floor, exists in a temperature/humidity controlled external environment, which can be controlled to simulate environmental conditions present in the hottest to coldest climates. A Design of Experiment approach was used to establish data needed for the model. The control variables in the experiments included: levels for the exterior environmental schedule and levels for the interior setpoint schedules for both zones. Simply, this data enabled data collection for constant or cyclical exterior environmental conditions and constant and scheduled interior setpoint conditions, not necessarily the same for each floor. From this data, a regression tree approach (Random Forest) was used to develop models to predict the room temperature as measured by each thermostat, as well as the cooling status for each zone. The models developed, when applied to validation data (e.g, data not employed in training the model) R<sub>2</sub> values of greater than 0.95. Then, the models developed were utilized for various 'What if' scenarios. Two such scenarios were considered. The first looked at the possibility of using the model to estimate comfort in a demand response event, e.g., when the grid manager calls for demand reduction. In this case, the heat pump providing cooling would be powered off for some time. The second scenario sought to quantify the cooling savings from use of higher thermostat setpoint during simulated non-occupied periods and for different exterior temperature schedules. The 'What if' predictions are validated with experimental data, thus demonstrating the value of the data-driven, dynamic data solely from smart WiFi thermostat information.

## Understanding the Impact of Fuel Volatility and Viscosity on Gas Turbine Engine Ignition

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Katherine Claire Opacich

**ADVISORS** Joshua S Heyne

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In the current alternative jet fuel certification process, approximately \$3-4 million and 20,000-100,000 gallons of fuel are used over a three to five year period to evaluate the behavior of new blends of fuel within engines. This extended process is not only costly but also carbon intensive. The National Jet Fuels Combustion Program's (NJFCP) mission is to streamline the certification process of alternative jet fuels, which is controlled by a fuel's operability limits for select ignition and lean blowout conditions. For ignition, the propensity of a fuel to ignite is limited by its ability to form a flammable mixture with air near a spark kernel. The fuel properties of viscosity and volatility largely govern this reaction because of their influence on the mean droplet size and vaporization rate, respectively. This research aims to achieve a thorough droplet modeling analysis and surrogate generation that imparts key information about whether viscosity or volatility is the fundamental factor in ignition performance. The proposed work will also supplement the NJFCP's goal of assessing the behavior of alternative fuels within combustors with minimal engine testing. Success of this research will assist the NJFCP in their efforts to accelerate the alternative fuel certification process, promote the de-carbonization of aviation jet fuels, and produce next generation high performance fuels.

### Analyzing the Use of Pressure Sensing Shoe Insoles for Biomechanical Research

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Kevin Michael Nowacki

**ADVISORS** Timothy Reissman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The foot is an especially intricate piece of the already complex human body. In biomechanical research, gait is a popular research topic, but it is hard to demonstrate—or even understand—how the foot articulates. Motion capture is a common way to attempt to analyze how the foot works during gait. This method has shown major improvements in understanding the human foot, but has many limitations. There can be variation on where markers are placed, which lead to varying kinematics, which leads to inconsistent results. A pressure sensing insole could assist in understanding multi-segment foot kinematics. This would allow pressure mapping of the foot throughout the gait cycle. There are limited people and studies that have looked at pressure mapping of the foot through gait using insoles. In collaboration with a company called SensingTex out of Spain, I am experimenting with their product in development to analyze if it could be useful for future biomechanical research. This research will hopefully validate the device, and show it can accurately detect how people are distributing their weight across their foot. The ability to see how and where the pressure is being dispersed throughout the foot during gait can open a lot of doors and create many opportunities for other research moving forward. This research is a pilot study to analyze how the device works, and if it is a viable option for understanding multi-segment foot kinematics. Through initial testing, it was found that the sampling rate of the sensors is not fast enough to get an adequate number of samples during a foot strike. The next steps include increasing the sampling speed of the sensors, and continue testing to compare these data.

### Wearable Cardiac Monitoring

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Sarah V Miller

**ADVISORS** Timothy Reissman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Arrhythmias, or irregular heartbeats, are a very common problem. In the United States alone, it is estimated that more than 850,000 people are hospitalized each year for arrhythmias. One of the most common arrhythmias is atrial fibrillation. Atrial fibrillation is a quivering heart beat that can lead to serious issues such as blood clots and strokes. There are several existing products, such as Fitbits and Apple Watches, that are working towards being able to detect and alert users of possible atrial fibrillation. This project looks into how to improve existing technology as well as how to modify it to detect other forms of arrhythmias.

### Energy GPA in Student Neighborhood

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Saroj Bhattarai

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

The University of Dayton houses almost 90% undergraduate student in on-campus residence. The university charges a fixed amount to every student for a semester, that amount covers the utility bills for that semester and no penalty charges even if they waste energy. This may lead to unnecessary use of energy like turning light on when the residence is empty and setting the thermostat set point constant every time. These behaviors can be controlled if an incentive is offered to the students that motivate them to use

energy efficiently. This is possible in UD due to unique nature of university housing with separate gas and electric meter. A mathematical model is developed in R-software using the historical electrical and gas usage data from utility provider DP&L and Vectren respectively. This model helps to disaggregate the weather dependent and weather independent energy use. The actual energy use is compared with the baseline, heating and cooling energy use of the student residence. A report card is developed to provide the student with the feedback about their energy usage status and their residence's energy saving level in the student neighborhood. This energy performance report card is sent to every resident via email which contains energy grade for natural gas, electricity and overall energy grade, residence rank in student neighborhood for energy saving, winning residence, and tips for improving the energy grade in the successive months. The residents of the winning residence are awarded a t-shirt and an article of the winning residents in a flyer news as a part of this program to incentivize them. After the implementation of this program, 5 to 10% of carbon emission saving is achieved through natural gas saving and some carbon emission saving is available from electricity saving due to change in student behavior toward energy use.

## **Design of a Body-Powered, Variable Strength and Conformable Shape Prosthetic Hand**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Zhipeng Jiang

**ADVISORS** Timothy Reissman

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

People with below elbow amputations often wear a body-powered prosthesis due to its affordable cost and the fact that it can improve their ability to do daily activities. While this technology is functional, it poses difficulties when trying to work with a range of different objects. The focus of this work is to improve its versatility by engineering both variable grip strength and changeable gripper shape capabilities into the device. Through mechanism design, the new prosthesis will have user-selected force options, thereby being able to hold objects of different masses. Additionally, exploring conformable-topology gripper designs will enable the ability to be able to grab items of diverse shapes and textures.

## **Bargain Brand Justice: Ohio's Indigent Defense Funding Model Makes Justice Inaccessible and Undermines the Sixth Amendment**

School of Law: School of Law

Poster - Independent Research

**PRESENTERS** Ebony D Davenport

**ADVISORS** John P Feldmeier

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

In 1963, the Supreme Court of the United States ruled that the Sixth Amendment right to counsel shall not be denied to anyone due to their ability to pay in *Gideon v. Wainwright*. The right to adequate legal representation is a noble one that sets this nation apart from other areas of the world. However, without the proper infrastructure, this right becomes less revolutionary and more decorative. When public defender offices are not properly funded, the most vulnerable among us are denied a fundamental right; justice becomes an experience exclusive to the elite; and the adversarial system is won not by the best advocate, but by the depth of her resources. The county-by-county funding model employed by the state of Ohio has the potential for causing disparities among counties because public defender offices are funded based on property tax revenue. This approach to funding creates a piecemeal system in which one's access to justice depends largely on which county he is arrested. When the burden is shifted to the counties, they struggle to provide for public service like waste management, libraries, and schools. This strain on funding creates a Hunger Games-like situation wherein various public services compete for extra crumbs. Because Ohio's current funding model for indigent defense prevents residents from equal access to justice, thus depriving them of a fundamental right to counsel, a new funding source that is independent from the general fund will allow for (1) counties to be fully staffed, (2) proper expert witnesses that can potentially strengthen a client's defense, (3) reduce excessive caseloads which undermine quality representation, and (4) ensure that Gideon's promise is upheld.

## **Optimization of Density and Surface Finish in Metal Additive Manufacturing**

University of Dayton Research Institute: Additive Manufacturing

Poster - Independent Research

**PRESENTERS** Allyson Meagan Cox

**ADVISORS** Jared W Speltz

**LOCATION, TIME** RecPlex Main Gym, 9:00-10:15

Laser Powder Bed Fusion is a type of additive manufacturing of metal parts that uses fine metal powder that is melted together by a high powered laser, layer by layer, based off a CAD model of the desired design. The metal additive field has gained recent and widespread attention for its innovation, customization, and prototyping. However, due to the nature of industries such as aerospace and defense, the demand for quality products is high. Two ways to measure quality of a finished additive part are density and surface roughness. These properties were measured and compared against changing print parameters to determine process settings that yield optimum part quality. Inconel 718 powder was used in the Advances Technology Laser Additive System (ATLAS) to create test pieces with critical geometries in the design. The individual layers of the part were scanned for profilometry data to analyze internal

and edge surface roughness. In addition, the final part characteristics were determined using density testing and metallurgy. During the print, volumetric energy density (VED), mark speed, power, hatch design and part design all remained constant. The number of contours around the edge of the design layer and the offset to hatch were altered for each part. These parameters were compared against each other in the results of the experiment to determine the critical settings of an additive manufactured part that would lead to quality finished parts without post processing.

### **Chamber Music Recital**

College of Arts and Sciences: Music

Performance - Course Project, 201810 MUS 390 10

**PRESENTERS** Caleb Joseph Baron, Andrew Robert Buser, Kara Manteufel Camfield, Elizabeth M Craft, Ian C Denney, Adam Michael Essling, Margaret E Feder, Anna Louise Herrmann, Kaity Marie Jones, John R Kennard, Mariya Josephine Miles-Flynn, Bridget Rose Oleksy, Katlyn E Poulsen, Alexander James Rice, Emily Rose Robinson, Timothy Daniel Schroeder, Shelbi J Wagner

**ADVISORS** Kara Manteufel Camfield, James R McCutcheon, Shelbi J Wagner

**LOCATION, TIME** Sears Recital Hall, 10:00-11:00

Student musicians will present a program of chamber music that they have worked on through the course of the semester. All students in the various ensembles have been coached by the Department of Music Faculty in the preparation of their program.

### **Vatican II and a major shift in Catholic schools**

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Joe Simon Pieper

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 10:30-10:50

Catholic education has long been held as a foundational and important piece of the Catholic experience. Thousands of students attend Catholic primary and secondary school every year. Vatican II brought about major changes to the Catholic Church as an institution. Many changes were also brought to Catholic education after the conclusion of Vatican II. The occurrences of Vatican II provided Catholic education with much needed updating to the pedagogy which they used to teach students. This post Vatican II offered teachers ways in which to better prepare their students for a faith life in a more secular and modern society. This paper will look at how changes at Vatican II to education gave teachers better tools to empower their students, while also giving schools better reach to non-Catholics. In other words Catholic schools were not only better equipped to defend and strengthen the faith, but to also work as evangelizers for the Catholic faith.

### **STEM Stories After-School Program**

College of Arts and Sciences: Mathematics

Oral Presentation - Independent Research

**PRESENTERS** Caelin Marie Micks, Lisa Jane Musselman, Haley N Rusnak

**ADVISORS** Shannon Olivia Schirack Driskell, Marie Margaret Pinnell, Mary Catherine Sableski, Todd B Smith

**LOCATION, TIME** Kennedy Union 207, 10:30-10:50

The STEM Stories afterschool program is held at Kiser PreK-6 School, a Dayton Public School where 93% of the students live in poverty and are from various ethnic backgrounds, including black American, white American, Turkish, Hispanic, African, and others. We are providing instruction to approximately 20 second-, third-, and fourth-grade students. These students are not on track to pass the Ohio Third Grade Reading Guarantee, which mandates schools to identify at-risk readers through diagnostic assessments and to provide specific interventions, such as intensive reading instruction and afterschool programs (Ohio Department of Education, 2016). We are making a difference and influencing these students' lives through innovative, engaging, fun, and highly integrated literacy and STEM activities that reflect research-based best practices for improving literacy and attracting underrepresented populations to STEM. We are supporting these students' academic and social needs and engaging with the Dayton community, while developing critical and innovative teaching skills. The relationship we have developed with the teachers at Kiser PreK-6 School—and with the children in the Literacy and STEM program—is unique. As undergraduate students, we accepted leadership of the delivery of the lesson plans in the afterschool setting. We work in collaboration with the inservice teachers and the university faculty to develop and deliver innovative lessons. The benefits to these relationships are evident at many levels, including to the Kiser students, teachers, UD faculty, and our own professional development. During this session, we will share our responsibilities to this afterschool program, what we have learned, samples of the activities we are teaching, and samples of students' work.

### **Investigating the interaction of inflammatory pathways in tumor microenvironment using Drosophila cancer models**

College of Arts and Sciences: Biology

Oral Presentation - Graduate Research

**PRESENTERS** Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** Kennedy Union 211, 10:30-10:50

Tumor microenvironment (TME) consists of the tumor cells and the surrounding normal cells and plays a critical role in tumor survival and progression. Previous studies have shown presence of inflammatory components in the TME but role of these components on tumor progression is not well understood. The core inflammatory pathways that produce these components are conserved in *Drosophila*. Since 90% of tumors are epithelial in origin, we used the wing imaginal disc of *Drosophila melanogaster* to study the interaction of these key inflammatory pathways in the TME. To model the TME, we created FLP-out clones of co-activated oncogenic forms of Yki or RasV12 in polarity deficient cells marked by GFP surrounded by normal cells. These mosaic clones allow us to test changes in intercellular and signaling interactions within the tumor, surrounding its microenvironment and in distant normal cells. This clonal system recapitulates the clonal origins of human cancer and provides a distinct advantage in analyzing intratumoral and other interactions that affect tumor growth. Using immunohistochemistry, we studied the activity of TLR, TNF and JNK pathway. TLR component, Cactus and activated form of JNK, p-JNK were induced in the tumor cells whereas *Drosophila* TNF ligand, Eiger was upregulated in the surrounding normal cells. We hypothesized that a crosstalk between these key pathways in the TME promotes tumor survival and progression. So we decided to study the genetic epistasis interaction between JNK and TNF pathways to assess the requirement and roles of these signals in the TME. Our preliminary data suggest specific and significant roles for the TNF and JNK pathways. We are currently testing if TLR, TNF and JNK pathway genetically regulate each other or independently affect the TME and growth of tumors. Our research will help unravel the correlation between inflammatory pathways and tumor progression in an in vivo model.

## Desert Storm 1990

School of Engineering: Engineering Management, Systems, and Technology

Oral Presentation - Independent Research

**PRESENTERS** Hussain A M H H Alhabib, Abdulaziz Almajed, Mostafa Mohammad Almousawi, Ali S A M H M Baqer

**ADVISORS** Sean Albert Falkowski, Scott J Schneider

**LOCATION, TIME** Kennedy Union 310, 10:30-10:50

the presentation will be about desert storm (The Iraqi invasion of Kuwait) in 1990. the power point technique will be used and the full story will be presented. The war is also known under other names, such as the Persian Gulf War, First Gulf War, Gulf War I, Kuwait War, First Iraq War or Iraq War, before the term "Iraq War" became identified instead with the 2003 Iraq War (also referred to in the US as "Operation Iraqi Freedom"). The Iraqi Army's occupation of Kuwait that began 2 August 1990 was met with international condemnation and brought immediate economic sanctions against Iraq by members of the UN Security Council. Together with the UK's prime minister Margaret Thatcher (who had fiercely resisted the invasion by Argentina of the Falkland Islands a decade earlier), George H. W. Bush deployed US forces into Saudi Arabia, and urged other countries to send their own forces to the scene. An array of nations joined the coalition, forming the largest military alliance since World War II. The great majority of the coalition's military forces were from the US, with Saudi Arabia, the United Kingdom and Egypt as leading contributors, in that order. Kuwait and Saudi Arabia paid around US\$32 billion of the US\$60 billion cost. Two of the presenters will explain their part of the story as they were there.

## Studying Political Behavior: How the Internet has Expanded Activism for College Students

College of Arts and Sciences: Political Science

Oral Presentation - Course Project, 201780 POL 311 01

**PRESENTERS** Katherine Rachel Liming, Naimeh Osama Saleh

**ADVISORS** Christopher J Devine

**LOCATION, TIME** Kennedy Union 312, 10:30-10:50

During the aftermath of Election 2016, researchers gained an interest in how social media influenced candidate popularity and how activists were using these tools to organize and mobilize potential voters. In this presentation, we will utilize the tools of surveys and in-depth interviews to study public opinion and political behavior amongst University of Dayton college students. Our objective is to explain how students are using their social media platforms to engage with other people's opinions and develop their knowledge of political issues. Do college students use online tools to take political action instead of in-person action? Do social media feeds influence more online action amongst students? As candidates increasingly turn towards social media to garner votes, college students may be the key to understanding the relationship between social media and American politics today.

## Effect of Stabilizing Agent Concentration on the Development of Renewable-Magnetic Nanocomposites

School of Engineering: Chemical Engineering

Oral Presentation - Graduate Research

**PRESENTERS** Frankie Ann Petrie

**ADVISORS** Erick Vasquez

**LOCATION, TIME** Kennedy Union 331, 10:30-10:50

Magnetic nanoparticles are attractive materials due to their ease of manipulation under the presence of a magnetic field and their inherent superparamagnetic properties. In order to produce a stable colloidal solution of magnetic nanoparticles, several

encapsulation mechanisms or stabilizing agents have been proposed. In this work, iron oxide-lignin nanoparticles were synthesized using a co-precipitation method and a self-assembly mechanism in alcohol/water mixtures using Kraft lignin in twenty percent ammonium hydroxide solutions. The effects of five different ratios of iron to lignin solution were analyzed in the syntheses process, four changing the amount of lignin used, one changing the concentration of iron used. The particles were characterized by DLS, TEM, UV-Vis, FTIR, and zeta potential analyses. The hybrid nanoparticles showed an average diameter around 200 nm. TEM images of the particles displayed encapsulation of iron oxide within the lignin. The results of this research show that superparamagnetic iron oxide nanoparticles coated with lignin were successfully synthesized. The outstanding properties of lignin as a renewable material, which could be used as antioxidant, UV adsorbent, antimicrobial agent, or biomaterials conjugate, make the lignin-magnetic nanocomposite a unique substrate for a plethora of future investigations.

## **Facing Dayton: Visualizing Neighborhood Narratives**

College of Arts and Sciences: Art and Design

Oral Presentation - Course Project, 201780 VAD 412 01

**PRESENTERS** Lucy Elizabeth Bratton, Josie Marie Libecap, Nyla C Sauter, Caitlin Joanne Schneider

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** Marianist Hall Learning Space 218, 10:30-10:50

The Facing Project is a nonprofit that connects people through stories to strengthen communities. It is a community story-telling project that intends to bring awareness about human rights issues and assets of a community to inspire social action. Students will present work created in connection with the Fitz Center's Facing Project that were then exhibited at the Human Rights Center's biennial conference, The Social Practice of Human Rights 2017. For the exhibit, senior graphic design students were paired with a community member's story that captures the experience of living in Dayton and the challenges or advantages that go along with it. Following several preparatory activities, students met one-on-one with their storyteller, an experience that furthered their connection to community and inspired them to create impactful book designs intended to bring poetic justice to their subjects and life to their stories. Through awareness outlets such as "Facing Dayton: Visualizing Neighborhood Narratives" communities can come together to discover new solutions to the problems of intolerance and indifference.

## **Thy Kingdom Come: Catholicism and the Nueva Canción, 1966-1982**

College of Arts and Sciences: Music

Oral Presentation - Honors Thesis

**PRESENTERS** Elizabeth Mary Turnwald

**ADVISORS** Samuel Noah Dorf

**LOCATION, TIME** Kennedy Union 311, 10:30-10:50

Within Latin America's tumultuous political atmosphere during the 1960s through the 1980s, a grassroots musical genre called the nueva canción emerged. Meaning "new song," it sought to unify the poor and marginalized through a combination of folk influences, indigenous musical styles, and politically-charged lyrics. Although they achieved similar commercial success to U.S. contemporaries such as Pete Seeger, Woody Guthrie, and Joan Baez, the folkloristas [folksingers] of the nueva canción often incorporated references to and elements of Catholic liturgical practice. Considering the reforms of the Second Vatican Council and the advent of a Latin American Liberation Theology, the time was ripe for cultural revolution by the poor, for the poor. While military dictatorships and civil wars ravaged many Central and South American countries, many of those who were suffering sought refuge in Christian Base Communities. These small groups of lay Catholics would meet regularly to discuss the week's Scripture, to sing and pray together, and most importantly, to heal. The unorthodox, yet explicitly religious, nature of these groups offered opportunities for non-liturgical and popular music to enter a paraliturgical setting. In this project, I seek to contextualize the nueva canción within this distinct intersection of the sacred, the secular, and the genre's specific mission of social justice. Considering the ubiquitous Catholic culture of Latin America, by studying the surrounding social and political context and by examining the lyrics and performance practices of the nueva canción from a theological perspective, I will interpret how Catholic theologies and liturgical practices affected the reception of this unique genre.

## **Creating Inclusive Community: Examining Privilege and Taking Action**

College of Arts and Sciences

Panel Discussion - Course Project, 201810 UDI 380 M1

**PRESENTERS** Brett A Bartlett, Darius Jamal Beckham, Leah Ashton Bell, T.J. John Belsterling, Laura Gabriela Benitez, Dezanee M Bluthenthal, R Darden Bradshaw, McKenna Elizabeth Czekajlo, Andrew Stephen Durkin, Russell Thomas Kientz Elting, Lakesha M Fountain, Brianna Gavin, Veronica Renee Halfacre, Claudia E Jackert, Ambria K Jones, Paul Philip Kramer, Jenna Renee Lakes, Shadayah Kabre Lawrence, Caroline Rose Nevius, Alure M Powell-Russell, Majd Shisha, Cierra Lynn Waller

**ADVISORS** Amy E Anderson, Daria Y Graham, Thomas L Morgan

**LOCATION, TIME** Kennedy Union East Ballroom, 10:30-11:30

This presentation will explore the historical and social implications of diversity and privilege, discussing participants' experiences in examining their own privilege while dialoguing with others about diversity and social justice. Additionally, participants will reflect upon their experiences attending the White Privilege Conference as well as their plans for designing sustainable actions to



dismantle injustice in the UD community and beyond.

## **You and Me and Everyone Else: Photography Senior Capstone Projects**

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** Sara Elizabeth Frederick, Sylvia Marie Stah, Brooke Beckman Tinsman I

**ADVISORS** Glenna Marie Jennings

**LOCATION, TIME** Marianist Hall Learning Space Commons, 10:30-11:30

Join us for "You and Me and Everyone Else," a presentation of Senior Capstone photography projects by three emerging artists and photographers. Living with Type I Diabetes, exploring the world of Color Guard performance and navigating the myths and realities of Midwest American culture are among the topics taken on within the students' research. Sara Frederick, Sylvia Stahl and Brooke Tinsman will discuss their individual works and offer insight into the world of contemporary image-making.

## **How is human trafficking depicted online?**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Mara Nerlinger Joelle Nerlinger

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

Human trafficking is a current and relevant social issue. While human trafficking has gained some attention in the media and in the academic literature, the details about human trafficking remain elusive. Using content analysis, this study examines 10 human trafficking websites to examine common themes in how human trafficking is depicted online. The findings show common themes related to gender, specifically the relationship between gender and visual images, sex trafficking and labor trafficking, and language. This content analysis explores the variability between what is discussed in the academic literature and how this compares to online depictions of human trafficking.

## **Let's Get It On: An Analysis of LGBTQ+ Hookup Culture at The University of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Elizabeth Clara Kyle

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

Hookup culture is a phenomena that has changed modern dating culture through altering attitudes about sexual interactions, especially on college campuses. Previous research on college campus hookup cultures tends to focus white, middle class, heterosexual relationships and attitudes. This study examines perspectives of hookup culture within the LGBTQ+ community on the University of Dayton's campus, a group often not acknowledged in research. Through one-on-one interviews, respondents expressed their views on hookup culture and how it potentially differs and relates to heterosexual, college campus hookup culture. A deeper look into themes from respondents will be further examined in my presentation.

## **Perception of Bystander Intervention amongst Students at the University of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Caleb Negron

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

Sexual violence is a prominent issue on college campuses with the majority of survivors consisting of women. Bystander intervention is heavily promoted as an effective method to combat the issue especially in the context of a college campus due to higher risk of individuals experiencing sexual violence. In this study, we are looking at an alternative programming of promoting bystander intervention through the use of peer-to-peer dialogue as well as how gender influences the likelihood of someone intervening. The peer-to-peer programming that will be utilized in this study is called PAVE Chats. Pre- and post-surveys are used to examine key factors associated with changes in students likelihood to intervene in a situation. These findings help identify other methods of bystander intervention programming and how gender influences the students likelihood of intervening.

## **"Sleep, eat, hydrate, masturbate!": Sexuality education, digital media, and creator identity implications**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Emma Rutledge Venetis

## CHRONOLOGICAL ORDER

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

With the rise of digital technology, authority figures are no longer able to regulate what information young people have access to. Yet, the curriculum in sexuality health classrooms continues to be debated while little research has been done examining the easily-accessible information that lives on the Internet. This thesis analyzes two popular sexuality education-based channels on YouTube, sexplanations and lacigreen, with subscriber counts ranging from nearly half a million to over 1.5 million. Data were collected through content analysis of approximately 27.5 hours of video. Findings indicate that sexuality education on YouTube takes a comprehensive, “sex positive” approach, covering a range of topics including anatomy, sexual orientation, consent, contraception, and sexual instruction. Video creators’ values and identities, as well as the structure of YouTube itself, impact the information that is presented. This analysis is significant as it indicates that formally regulated sexuality education programs may no longer be relevant and user-generated digital education is introducing new perspectives on sex and sexuality to young people.

### **How do you prefer your coffee? An outlook on interracial relationships**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Cheranee L Baker

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 10:30-11:30

This project examines the experiences of those in an interracial relationship and how that has affected their relationships with family and friends. The goal is to examine if and how interracial relationships have evolved, since they have become legalized. This research uses data gathered from interviews with interracial couples. The findings point to improvements over time in acceptance and approval from families, friends, and the church. Other related factors, such as religion are also discussed.

### **Cards Against Incivility: Play the Beta Version of the Game**

College of Arts and Sciences: Communication

Panel Discussion - Course Project, 201810 CMM 100 H2

**PRESENTERS** Ian James Beach, Nathan A Brelage, Rachel Elizabeth Carr, John Currie Dickson, Bridget Anne Fallon, Luke F Flottman, Courtney G Harbert, Indigo Emma Hudepohl, Susanne Jacobsen, Sean Wesley Kapp, Julia Karlsson, Adam Gregory Kaye, Joshua Edward Kinser, Ean Cole Kuska, Bo A Leszczynski, Kylie E Moellering, Paul C Mossing, Jenna Mary Perdue, Katherine A Perille, Cara M Rasmussen, Emily Viktoria Sandstrom, Cassandra L Secrease

**ADVISORS** Cassandra L Secrease

**LOCATION, TIME** Kennedy Union Torch Lounge, 10:30-11:30

We have all heard of the popular game with a similar name but Cards Against Incivility (CAI) is the game you play to increase your understanding of civility. Players of CAI choose, explain, and defend, as needed, a variety of responses to common and perhaps some not-so-common communication situations. Has anyone ever gone on a political rant at your Thanksgiving dinner? Have you ever returned to your dorm room only to find your roommate practicing their air-guitar routine? Ever experience speechlessness when someone makes an offense joke? CAI will help you consider possible reactions to such situations and many, many more!

### **The Things He Left Behind**

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Jenna M Gomes

**ADVISORS** Chris J Burnside, Meredith L Doench, David J Fine

**LOCATION, TIME** Humanities 110, 11:00-11:20

“The Things He Left Behind” is a short story cycle inspired by the consequences of war and the power of legacy. It follows a young soldier, Felix Rocha, through the eyes of the many people that he impacted throughout his short life. This character is based off of the real-life soldier, Felix Del Greco, who was the first National Guard member to die in Iraq. The incorporation of artifacts into the story is meant to mix fiction and reality; to present to the reader both the real Felix and the fictional Felix. As Tim O’Brien famously said, “story-truth is truer sometimes than happening-truth.” This short story cycle is meant to make a lasting impact on the reader, leaving them with the question, “What are the things that I will leave behind?”

### **Corporate Reputation Management and Its Web Presence**

College of Arts and Sciences: English

Oral Presentation - Course Project, 201810 ENG 372 07

**PRESENTERS** Rahaf M H F Al Hamad, Laylah Victoria Funk, Ben Joseph Golab, William Peter Jacobson, John Frederic Kusch, Katherine Mary Leibold, Douglas Lee Lutz, Thomas Williams Martin, Benjamin Michael McDermott, Grace Marie Moriarty, Alvaro Navarro Ilundain, Connor James Schrauth, James Eugene Studer, Conor James Tunney

**ADVISORS** Xiaoli Li

**LOCATION, TIME** Humanities 118, 10:30-12:00

Students in ENG 372 Business & Professional Writing classes participated in a 6-week virtual business professional project that involves almost 600 students in 96 teams from 14 universities in 7 countries. All teams were asked to identify an organization that has a robust online presence, such as a web page, Facebook page, Twitter feed, customer blog, and so on. Then the team analyzed the quality of these mechanisms in terms of building and maintaining the organization's reputation, especially whether the organization is conveying its core values through its social media use. Finally they wrote a report that introduces the organization and its online communication tools, provides an analysis of its online presence, and offers recommendations how the company can improve its online presence. They evaluated the company's reputation (built in or bolted on) and provided evidence for their conclusions. This project emphasizes the development of critical-thinking, cross-cultural communication in global contexts, virtual collaboration and team-building skills, as well as project management skills.

## **Walker Light for Improved Mobility in Older Adults: Effects and Recommendations**

School of Engineering: Mechanical and Aerospace Engineering

Porch Project - Honors Thesis

**PRESENTERS** Lauren Marie Rivera

**ADVISORS** Kim E Bigelow

**LOCATION, TIME** 413 Stonemill Road, 11:00-11:15

As a direct response to a need in our community, this project sought to evaluate the effectiveness of a lighting device for older adult walker users. A staff member at St. Leonard Retirement Community in Centerville approached our team about residents having issues with current walker designs. This thesis focuses specifically on the testing related to the lighting device portion of the larger SmartWalker project. This part of the study sought to compare how older adults who regularly use rolling walkers navigate in darkened environments, such as getting up at night to use the restroom, with and without the walker light device on. To complete this comparison, rolling walker users were studied as they performed a series of walking tasks. These included a walking-speed trial and an object identification trial. Each task was performed under multiple lighting conditions, ranging from daylight to almost completely dark. Speed and distance showed some changes when the lighting device was used, but these changes were not significant increase in mobility when the lighting device was used, compared to when it was not in use. There was no correlation between participant rating of confidence and mobility outcomes. The small number of participants and the great variation of lighting among the different testing locations were factors. The participants confirmed they benefit from increased light, and the majority would be willing to attach and charge the device regularly. Also, 86% of participants agreed that the lighting device was as good as, or better than, using a night light in their room at night. Although the results were not significant under the testing conditions used, in-home testing with more participants should be conducted to determine if lighting devices would aid in increased mobility.

## **Understanding Salvation in the Modern Age: Post Vatican II Perspectives**

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Taylor Kate Tovey

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 11:00-11:20

Prior to the Second Vatican Council the official teaching on salvation in relation to other religions is summarized in the phrase, "No salvation outside of the Church." Vatican II is a major turning point in developing the Catholic Church's approach to salvation. In the aftermath of Vatican II theologians have debated the proper interpretations of council documents including Lumen Gentium, "On the Church" which describes the Catholic Church's role in the world and in salvation. Lumen Gentium 16 affirms the possibility of salvation for non-Christians but the actuality of how and by whom salvation is achieved is largely contested.

## **Uniqueness and existence of solutions of boundary value problems at resonance for ordinary differential equations.**

College of Arts and Sciences: Mathematics

Oral Presentation - Graduate Research

**PRESENTERS** Jabr Ateeg Allah Aljedani

**ADVISORS** Paul W Elloe

**LOCATION, TIME** Kennedy Union 207, 11:00-11:20

A quasilinearization algorithm is developed for a specific boundary value problem at resonance. To do so, a standard monotonicity condition is assumed to obtain uniqueness of solutions for the boundary value problem at resonance. Then the method of upper and lower solutions and a shift method is applied to obtain the existence of solutions. A quasilinearization algorithm is developed and sequences of approximate solutions are constructed that converge monotonically and quadratically to the unique solution of the boundary value problem at resonance.

## **Increasing taxonomic and functional diversity are linked with temporal stability of abo-**

## veground biomass and coarse woody productivity in a subtropical Taiwan forest

College of Arts and Sciences: Biology  
 Oral Presentation - Graduate Research

**PRESENTERS** Julia I Chapman

**ADDITIONAL AUTHORS** Jyh-Min Chiang

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** Kennedy Union 211, 11:00-11:20

The ability of an ecosystem to withstand perturbation without a major change in its function, also known as ecosystem stability, is hypothesized to increase with biodiversity. High levels of diversity can buffer an ecosystem against the impacts of species loss because the remaining species can compensate for any loss of function. We examined the relationship between both taxonomic and functional diversity and the stability of forest carbon storage (woody biomass production), which is an important ecosystem function due to its potential role in mitigating anthropogenic climate change. In a subtropical broadleaved forest in Taiwan, all woody stems were tagged, identified to species, and measured (diameter) across 625 quadrats in 2004, 2009, and 2014. Ecosystem stability was calculated as the coefficient of variation in aboveground biomass (CV AGB) and the change in coarse woody productivity (delta CWP). We tested for correlations between these stability metrics and species richness, Shannon diversity, functional richness, and function dispersion. Overall, we found that Shannon diversity and functional dispersion were more strongly correlated with ecosystem stability than richness metrics. The amount of woody biomass and its rate of production were more consistent through time in quadrats with higher Shannon diversity and functional dispersion, which suggests that the evenness, or relative abundance, of species and their functional traits is an important contributor to ecosystem stability along with the sheer number of species or trait types present. We also found that some soil characteristics, such as pH and nutrient availability, were linked with stability in a way that suggests resource-rich environments tend to be less stable in woody biomass production through time. These patterns are consistent with the diversity-stability hypothesis and indicate that soil conditions are an important factor, but further analyses are needed to understand how topography and typhoon disturbance may also interact with ecosystem stability.

## On-chip memristor training with detailed op-amp circuit

School of Engineering: Electrical and Computer Engineering  
 Oral Presentation - Graduate Research

**PRESENTERS** Baminahennadige Rasitha Fernando

**ADVISORS** Tarek M Taha

**LOCATION, TIME** Kennedy Union 310, 11:00-11:20

Neural networks have gained and renewed widespread attention in recent years due to large volumes of data generation in almost all fields. This led to development of Deep Neural Networks (DNNs), which have demonstrated significantly better classification on image recognition and other datasets than previous techniques. DNN algorithms have two phases: training and inference that typically run on graphics processing units (GPUs). The training phase is much more computationally challenging, therefore it is difficult to implement it on low power systems. There is an urgent need for new systems that can provide real-time data processing with high power efficiency. Implementing learning on low power systems can open-up a broad new set of applications – particularly in making systems more smart and secure. Nanoscale analog devices called memristors can be used for this specific purpose, which can execute computations in parallel and consume small area and low power. These characteristics in the computing system allows implementation of the training of DNNs, consuming about 10000 times less energy than a GPU. In literature, fix gain op-amp circuits are suggested in memristor crossbar-based learning. Due to frequent change in the resistance values of the crossbar at weight update (will affect the op-amp gain function) causes the neural network training to fail in a circuit level implementation. A detailed op-amp circuit has been proposed to improve memristor neural training. Two and four odd parity tests at different discretized pulse width provided significant results. This detailed circuit and device analysis of the op-amp implementation may serve as a foundation for further circuit-level studies.

## The impact of the non-native invasive shrub *Lonicera maackii* on sensitive salamander populations in headwater streams

College of Arts and Sciences: Biology  
 Oral Presentation - Honors Thesis

**PRESENTERS** Meg Eileen Maloney

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** Kennedy Union 311, 11:00-11:20

*Lonicera maackii* has dramatically shifted ecosystems across much of the Midwestern USA and has been linked to alterations in riparian zones along headwater streams. The foliage from *L.maackii* releases water-soluble photochemicals into the ecosystem that have adverse effects on insects, herbivores, and plants. Previous research has demonstrated that *L.maackii* has negative impact on the growth of several amphibian species; however, little is known about the impact on stream salamanders, which are most common in headwater streams. While qualitative assessments of stream salamanders are a common practice, estimation of population density remains a methodological challenge. Our research goals were to (1) invent a prototype device for quantification of salamander abundance in streams, (2) validate this prototype through field trials across seasons and habitat types, and (3) implement the developed technology to further understanding of salamander presence and abundance along an invasion gradient of *L. maackii*. We

developed a new artificial habitat for sampling salamanders that allows for density calculations. Field trials revealed that this method was superior for estimating salamanders than other methods including the standard Visual Encounter Survey (VES) and allows for estimation of population density. This invention was used to assess stream salamander abundance and richness along a gradient of *L. maackii* invasion.

## Prospect Theory: An Analysis of Decision Under Risk

College of Arts and Sciences: Mathematics

Oral Presentation - Capstone Project

**PRESENTERS** Wyatt Michael Ohm

**ADVISORS** Dan Ren

**LOCATION, TIME** Kennedy Union 312, 11:00-11:20

Prospect Theory, developed in 1979 by Daniel Kahneman and Amos Tversky, attempts to describe how individuals make choices between probabilistic alternatives where risk is involved and the probabilities of different outcomes are unknown. Choices among risky prospects exhibit many different effects that are inconsistent with the expected utility theory. I will explain examples of studies that touch upon the certainty effect, isolation effect, and reflection effect. Based on these examples and findings, two functions will be introduced and explored: the value function and the weighting function. The value function is defined as concave for gains and convex for losses; and the weighting function, is usually higher (lower) than the corresponding probabilities when probabilities are low (high).

## An Analysis of Authentic Existence Online

College of Arts and Sciences: Philosophy

Oral Presentation - Honors Thesis

**PRESENTERS** Alia Francesca Whitney

**ADVISORS** Steve Bein

**LOCATION, TIME** Kennedy Union 331, 11:00-11:20

When taken as a whole, one's authentic existence would necessarily include considerations of one's "being" online. In *Being and Time*, Martin Heidegger explores what it means to have embodied presence at the phenomenological level, concluding that one's existence is an activity of being-there performed by every human being through circumspect interaction with the world and society that surrounds it. Although he did discuss the impact of technology on a human being, Heidegger lived before the advent of the internet and was therefore unable to include its implications in his work. I discuss the implications the internet has for digital being using Heidegger's ideas, taking it a step further by discussing the digital world's impact on co-presence by drawing on Watsuji Tetsuro's responses to Heidegger in *Rinrigaku*. Watsuji zeros in on one's relationship to society, arguing that one simultaneously exists in union and separation with others and pushes on Heidegger's conceptualizations of the individual's existential process. With both Watsuji and Heidegger's arguments in mind, I argue that one fools oneself into a false sense of authenticity in being online. While authentic existence online is not impossible, it is easy to create an online presence that is composed of inauthentic being. I discuss this idea, relating the implications that follow to embodied presence.

## Infographics inspired by Paul Laurence Dunbar

College of Arts and Sciences: Art and Design

Oral Presentation - Course Project, 201810 VAD 415 01

**PRESENTERS** Brian Gallagher O'Malley, Hadley Caitlin Rodebeck, Isabella Pearl Vonachen, Olivia Derose Wendt, Ben D Woodruff

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** Marianist Hall Learning Space 218, 11:00-11:20

Students will address the graphic significance and creative thinking process of information design, exemplifying how a well-designed infographic can inform, express, clarify and/or transform complex information into a clear concise visual. The content of each infographic was inspired by the life of African-American writer Paul Laurence Dunbar. Students explored a variety of approaches using information gathered from a tour of Dunbar's grave in Woodland Cemetery, attending a Graul Chair Recital celebrating Dunbar's work, and taking a tour of his historic homestead. Through extensive research and data collection, students discovered fascinating connections between Dunbar and his contemporaries that lead to each one creating his or her own unique information design panel inspired by the life and work of Dayton native Paul Laurence Dunbar.

## Epicenter: Dayton's Opioid Crisis

College of Arts and Sciences: Communication

Documentary - Course Project, 201810 CMM 499 01

**PRESENTERS** Taylor Lee Alexander, John Francis Antonini, Grace E Barry, Patrick James Bernauer, Tom E Cook, Alexandra C Damiani, William E Delaney, Matthew Aidan Hilliard, Gregory R Kennedy, Molly Erin Moesner, Alexander A Moulvi, Florian Andreas Rieger, Cody Mitchell Rose, Maggie Ann Scully, Phoebe Marie Trogolo

**ADVISORS** Gregory R Kennedy

**LOCATION, TIME** Science Center 114 - Auditorium, 11:00-11:40

It's no secret that the heroin epidemic is a nationwide problem, but it seems to have impacted Ohio, especially Dayton, disproportionately. Media Production students at the University of Dayton are creating a documentary that educates and enlightens people as to the reality of living in the epicenter. After examining and presenting a scope and history of the problem, we are concentrating specifically on addiction as a disease, not a choice. During the course of our research, we have determined that most addicts do not use drugs to get high - they use them to avoid feeling sick due to their chemical and physical dependency. We have interviewed former addicts, treatment specialists, coroners and law enforcement officers for a comprehensive analysis of a problem that has existed for decades and likely will continue for many more. Presenting several points of view in the hopes of sharing how opioid addiction impacts different people, our documentary examines what different demographics of people believe could be the solution to mitigating an ongoing crisis. Our documentary is a call to action for the community at large, and we want to break the stigma of addiction. Whether you are married to an addict, lost a parent to addiction, or are a politician capable of spurring change, addiction does not discriminate.

### **Art Song Revival: Performances and synthesis of original music by Caleb Baron**

College of Arts and Sciences: Music

Performance - Independent Research

**PRESENTERS** Caleb Joseph Baron, Jack Bartholomew Destephano, Mary Catherine Donovan, Anna Margaret Ford, Alaina Louise Saliba

**ADVISORS** Tobias William Rush

**LOCATION, TIME** Sears Recital Hall, 11:00-11:40

Student musicians will perform original music for Voice and Piano by student composer Caleb Baron. The performance will include a presentation by the composer about the processes (such as style, techniques, and influences) used within each piece, cultivating an educational and exciting discussion of modern music in a classical style.

### **Rights and Security – Implications of Changing Power Relations**

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Caitlin M Acevedo, Zachary T Brasch, Andrew Thomas Caldwell, Matthew Patrick Clifford, Christian Anton Matico

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 11:00-12:00

Through the discussion of five case studies, this panel will address the role of the United Nations in mitigating the human rights and security implications of changing power relations at the national and international level.

### **OPS 495 Capstone Project Presentations (Part 1 of 3)**

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Bridget Marie Bittner, Ian Joseph Blair, Mateo Mateo Chavez, Abigail Catherine Dalton, David Addison Delworth, Brandy Alivia Gibson, Peter James Kania, Robert Cameron Kennedy, Brendan Christopher Kimes, Daniel Marquez, Jack Liam McHugh, Charles Gerald Reinhardt, Jack Elliott Schell, Daniel Eric Warner

**ADVISORS** Michael F Gorman, John J Kanet, Robert A Kinion

**LOCATION, TIME** Miriam Hall 103, 11:00-12:00

Senior Operations and Supply Management majors present the results of their Capstone Projects.

### **The STEM Gender Gap: An Evaluation of the Efficacy of Women in Engineering Camps**

School of Engineering: Mechanical and Aerospace Engineering

Porch Project - Honors Thesis

**PRESENTERS** Malle Rea Schilling

**ADVISORS** Margaret Frances Pinnell

**LOCATION, TIME** 418 Stonemill Road, 11:30-11:45

It is not uncommon to see a class full of engineering students with very few women in the room. To combat this gender gap, colleges and universities have employed outreach programs and developed summer engagement opportunities that allow women to explore engineering before they graduate high school. To understand how these programs affect the women who participate in them, a research study was conducted to evaluate the effects week-long engineering camps had on participants through a disseminated survey and observations of activities at both a single-sex female camp and a co-ed camp. Additionally, interviews were conducted with leaders of engineering camps at universities across the nation to better understand the programming and purpose of engineering camps.

## Vatican II and the Development of Religious Liberty

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** William Joseph Gross

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 11:30-11:50

Prior to the Second Vatican Council, Catholicism was given a special place of status, protection, and primacy in many nations. This was considered desirable by the Church since Catholicism was encouraged over other religions or competing ideologies. In this way true faith in God was better protected and encouraged for all people in a given nation. At Vatican II, the Declaration on Religious Liberty, *Dignitatis Humanae*, instead described religious liberty as a constitutional necessity in all places. What prompted this change in approach to the relationship between the Church and state regarding religious liberty? How are these changes reflected in the Church today, particularly in the United States? This research looks at the historical development of the relationship between the Church and state before, at, and after Vatican II into the present. In addition to *Dignitatis Humanae*, other texts from the council reveal that conscience contributed largely to the new formulation of religious liberty.

## Religion and Mental Health: Does religion help or hurt our psychological well-being?

School of Education and Health Sciences: Counselor Education and Human Services

Oral Presentation - Course Project, 201752 EDC 568 81

**PRESENTERS** Adam Hall Brandt

**ADVISORS** Daniel J Trunk

**LOCATION, TIME** Kennedy Union 207, 11:30-11:50

Religion and Christianity play a significant role in psychological health and coping with depressive symptoms (Fox, 2004; Pargament, Magyar-Russell, & Murray-Swank, 2005). The help-seeking behaviors religious people employ seem to have a positive effect on lowering depressive symptoms. However, not all the research pertaining to the relationship between depression and religion is quite black and white. Much discussion and nuance surrounds what specifically about religion helps to mitigate depressive symptoms. This research focuses on religion as it pertains to sects of Christianity (such as Catholics, evangelicals, Methodists, Lutherans, and Baptists). It does not focus on other religions that are similar to Christianity but are inherently distinct due to major conflicting beliefs about Jesus and salvation (such as Judaism, Islam, and Mormonism). The research focuses on religious people and attempts to find exactly what it is about religion that affects the psychological health of individuals, both in general and with major depressive disorders. The inconsistencies in the research are what drive this research proposal. Most research shows that religious involvement and salience positively impact mental health (Baker & Cruickshank, 2009; Den, 2006; Krause, 2010). However, the kinds of religious coping skills Christian people employ also can drive levels of self-mastery and self-esteem up or down, which then affect one's mental health in positive or negative ways (Newman & Pargament, 1990). There is also research that shows a U-shaped relationship between levels of religious salience and depression. This U-shaped relationship suggests that highly religious salient people face higher amounts of depression than moderately religious salient people (Schnittker, 2001). This research attempts to find common themes within the highly religiously salient group that could be contributing to their severity of depression.

## Evaluation of Iodine Concentrations and its Effect on Neurodevelopment

College of Arts and Sciences: Mathematics

Oral Presentation - Independent Research

**PRESENTERS** Marina Mancuso Li Mancuso

**ADDITIONAL AUTHORS** Daniel Finklestein (Georgia Institute of Technology), Dominique Forbes (Coastal Carolina University), Heidi Whiteside (Winston-Salem University)

**ADVISORS** Muhammad Usman, Alan A Veliz-Cuba, Andrew Wright (North Carolina State University)

**LOCATION, TIME** Kennedy Union 211, 11:30-11:50

Iodine plays an essential role in developing thyroid hormones, thyroxine (T<sub>4</sub>) and triiodothyronine (T<sub>3</sub>). These hormones are secreted by the hypothalamic-pituitary-thyroid (HPT) axis and are suggested to impact fetal neurodevelopment. A novel biologically based dose-response model developed by the students of the Modeling Applied and Industrial Mathematics REU at North Carolina State University analyzes the dynamics of iodine and thyroid hormone concentrations interacting between a pregnant rat and fetus. Parameter optimization and sensitivity analysis contributed to further understanding of the factors that influence the development of T<sub>3</sub> and T<sub>4</sub> due to iodine deficiencies.

## The International Committee of the Red Cross: Managing the Principles of Impartiality and Neutrality in an Increasingly Public, Media-hungry, World

College of Arts and Sciences: Political Science

Oral Presentation - Honors Thesis

**PRESENTERS** Mercedes Cecelia Ramsey

**ADVISORS** Joel Richard Pruce

**LOCATION, TIME** Kennedy Union 311, 11:30-11:50

One of the oldest humanitarian non-governmental organizations (NGOs), the International Committee of the Red Cross (ICRC) has long been a cornerstone around which all other humanitarian NGOs are built. The ICRC conforms to strict principles regarding their behavior and practices so that they can provide aid to those who need it around the globe. As NGOs began using both traditional and social media to their advantage to promote certain causes, the media and public began to push back, pressuring humanitarian NGOs to adopt some causes or speak out on others. Through studying the ICRC missions during the Nigerian Civil War in the late 1960's and the early 1970's as well as the current war in Syria, this research project intends to answer the following question: How has the ICRC's response to media pressures shifted the perception of humanitarian impartiality and neutrality for both NGOs and the public?

## **Out of Site, Out of Mind: An Assessment of State-Level Siting Policies for Wind Power Generation Facilities**

School of Engineering: Mechanical and Aerospace Engineering

Oral Presentation - Honors Thesis

**PRESENTERS** Madalyn Ann Beban

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** Kennedy Union 312, 11:30-11:50

The growth of the on-shore wind industry in the United States over the past decade alone has been monumental, yielding an eight-fold increase in national generation capacity. Economic incentives at the federal and state level coupled with technology advances influencing turbine operation have kept wind energy as a actionable choice for domestic power generation. With increased installations comes conflict. As projects are sited, a greater number of interactions with local communities and ecosystems occur. This project intends to address the conflict between project developers and community members by analyzing state-level wind farm siting policies nationwide. exploring approaches that balance the interests of landowners, community members, industry participants, and relevant stakeholders. Meeting current installation trends with policy that mitigates negative externalities on project surroundings can be done by governing bodies seeking to address these desires. Current siting policies at the state and county levels, where energy generation facility siting authority lies, were examined to locate possible systemic changes in the permitting process. Negative externalities from project siting, specifically social and environmental impacts on project surroundings, were identified. Following this, policy alternatives were compared in order to make recommendations for the best possible approach for creating equity as wind power spreads. With the goal of identifying policy actions for a more equitable siting process, options including permit streamlining, decision deadline implementation, and residential compensation plans, are recommended moving forward.

## **The Facing Dayton Project: Swim-to-Row Poster**

College of Arts and Sciences: Art and Design

Visual Arts Exhibition - Course Project, 201780 VAD 345 02

**PRESENTERS** Jeremy N Rosen

**ADVISORS** Misty K Thomas-Trout

**LOCATION, TIME** Marianist Hall Learning Space 218, 11:30-11:50

The Facing Project is a community story-telling project that intends to bring awareness about human rights issues and assets of a community to inspire social action ([facingproject.com](http://facingproject.com)). I participated in it while a student in Typography Two under Prof. Thomas-Trout. Typography Two deals with the ideas of the poetic, practical and persuasive nature of typography that encourages designers to investigate content from these varying perspectives. We were assigned personal narratives from individuals in the Dayton area, which we then analyzed to uncover inherent and potential meanings that could be translated visually as expressive, typographical posters. The process revealed ways to integrate the poetic, practical and persuasive ideas within the individual posters; typographically, these posters display poetic in the way it conveys the messages within these stories; practical in the sense that it disbursts the information; and persuasive in how it teaches the history of the Dayton communities while raising awareness on current social justice issues. In turn, our work functioned as "visual narratives" for stories about the unique experiences of community locals. Professor Thomas-Trout received the Experiential Learning Innovation Grant in the Fall of 2017 that helped fund an exhibition at the Dayton Metro Library. Students successfully developed this poster exhibition through these five teams: install, deinstall, curatorial, promotional, reception/food and beverage. I worked as head of the curatorial group throughout the process, strategizing with my peers on how to utilize spatial components to our advantage and on the placement of posters so as to invite viewers through the room. This community-based graphic design exhibition, "Facing Dayton: Visualizing Neighborhood Narratives" celebrated community and fellowship through the visual language and promoted the benefit of experiential learning.

## **The Experiences of African American Female Student Athletes at a Predominately White institution**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Javonna La'Mae Layfield

**ADVISORS** Leslie H Picca, Danielle C Rhubarth

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

African Americans make up the largest portion of students on collegiate athletic scholarships. While much has been written about



the experiences of African American male athletes, less has been written about the experiences of African American female athletes. This study examines how African American female student-athletes on the University of Dayton campus view their own experiences as being similar or different from their white athletic peers. Data are gathered using interviews with a convenient sample of African American women athletes. The participants share how their positionality of being a woman of color athlete impacts their experiences on campus academically, socially, and emotionally. The findings of this study suggest that women of color athletes occupy a unique role on campus; using an intersectional approach, their experiences cannot be reduced to “only race” or “only gender.”

### **Big Man on Campus: How does social construction of gender impact male college athletes?**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Masashi Greg Sakamoto

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

Male athletes are often glorified in the media as “the big men on campus,” as they enjoy elevated status on their college campus. Similarly, much has been written about toxic masculinity, and the expectations for men to value dominance, power, and control; this is especially prevalent among “toxic jock” identities which is associated with greater health risks. This study further explores the social construction of gender among male college athletes. Data are gathered using interviews with a convenient sample of male college baseball players who have experience competing at Division 1-level universities across the U.S. The findings from this study suggest that male college baseball players have an elevated status through their peers on campus and their idea of masculinity varies based on the size of their university.

### **Baby boomers and college students: Understanding the changing interactions between female baby boomers and students**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** MaryPat Globig Marx Globig

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

Faculty and staff members who have worked at a university for twenty or more years are in a unique position to be able to discuss how interactions between faculty/staff and students have changed over time. This study answers the question “How do baby-boomer faculty and staff members see a change in how students interact with them throughout their twenty or more years working in a university setting?” Data was collected using interviews with female faculty and staff who have worked in a university setting for more than two decades. Results indicate that female faculty and staff typically notice a shift in how students interact with them over the years; this shift is often attributed to different generational and cultural values as well as assumptions related to ageism and sexism.

### **Farm to Liberation: Towards Feminist Food Justice**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Elisabeth Clegg Spector

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 11:30-12:30

Women are one of the many vulnerable populations experiencing the detrimental effects of human-induced climate change, and our current system of food production is one of the largest contributors to this global problem. Not only do modern methods of food production contribute significantly to climate change, but they devalue women’s knowledge and strip away their opportunities. A number of communities and individuals have begun to work against this system and work towards food justice through small-scale farming and growing their own food. Through the use of ecofeminist scholarship and original interviews, this project examines the problems with our current food system and suggests steps and solutions for moving forward. So long as women are being fed by the very same systems that subordinate them, they will never be truly liberated, making it necessary for feminist food justice.

### **Global Injustice: El Salvador, Human Rights, and Liberation**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Course Project, 201780 ANT 325 01

**PRESENTERS** Therese Christine Golonka, Emily Clare Monczynski, Ellie Elise Rizzo, Emily Rose Wellmann, Corinne Mallory Woodruff

**ADVISORS** Miranda C Hallett

**LOCATION, TIME** Kennedy Union 310, 11:30-12:30

What are the ethical obligations facing human beings in a highly unequal world? What does working for social justice and human

rights mean in the Americas today? How does Catholic social teaching apply to contemporary issues of armed civil conflict, refugees and immigration, economic inequality, and more? What are the ethical dilemmas at the heart of today's headlines, and how can we be responsible global citizens in an era of nationalism? In this panel, we'll share the learning and insights we've gained through intensive study and immersion in the recent history and contemporary challenges of a small Central American nation, El Salvador. We will describe our thrilling and challenging adventure in El Salvador in January 2018. In recounting how we encountered conditions of cultural, social and political existence that moved us beyond our comfort zones, we'll also reflect on the ways these experiences might shape our future ethical commitments and social action. We will also talk about the broader insights we can gain from the local realities faced by the country, insights that touch on struggles over troubling contemporary issues such as immigrants' rights, state violence, and environmental crisis. Panelists will also share how they learned to think anthropologically through the course, and how anthropological perspectives can contribute to human rights efforts. This fall semester, another anthropology seminar focusing on human rights will be offered, this time connected to a public education project centered on immigrants' rights. Students will also have the option to cap their course experience with a trip to El Salvador during January 2019 intersession. Panelists will field questions about the course, and what it takes to prepare for a trip like this.

## **A Case Study of Student Perceptions of Transfer from First- and Second-Year Writing to the Disciplines**

College of Arts and Sciences: English  
Oral Presentation - Graduate Research

**PRESENTERS** Rebekah Lee Sanders

**ADVISORS** Patrick W Thomas

**LOCATION, TIME** Humanities 110, 11:30-12:30

First- and second-year required writing courses, typically housed within English departments and taught by English faculty, are valued by various stakeholders as a means of preparing students for future writing contexts. While these courses are intended to impart students with knowledge and skills to equip them for writing beyond the walls of the English classroom, students are often dubious of the value of these required writing courses to their future careers as students and professionals. As research on transfer becomes an increasingly-prominent area of focus within composition studies, the significance of students' own perceptions of the value of required writing courses has emerged as a key factor in determining how successfully they will transfer what they learn in those classes to writing in the disciplines (WID). This case study draws on insights from over 200 survey responses and six interviews to determine students' attitudes at the University of Dayton toward ENG 100 and 200 and the value of these courses to future writing contexts. Findings indicate that many students have misconceptions and questions about the purposes of these courses, which can contribute to distorted views of how transferable the skills and knowledge gained in these courses will be. In addition to shedding light on students' perceptions of transfer, this research argues for the importance of understanding students' forward-reaching conceptions of the purpose and value of writing instruction in order to ensure that transfer is possible.

## **Chaminade Scholars Journey Through Laudato Si**

College of Arts and Sciences: Institute Pastoral Initiative  
Interactive Display - Course Project, 201810 ASI 357 H1

**PRESENTERS** Kelsey Marie Albertino, Caroline Mary Compton, Jonathan W Conrad, Kelly F Fuller, Kaitlin Marie Gawkins, Elizabeth Anne Goetz, Luke Christopher Horner, Matt Patrick Leverick, Nathan George Mansour, Jean Yvan Munyankindi, Ellie Elise Rizzo, Joshua Wayne Romo, Taylor Kate Tovey, Corinne Mallory Woodruff, Yu Zhao

**ADVISORS** Maria Ollier Burkett, Angela Ann Zukowski

**LOCATION, TIME** Alumni Hall Basement, 11:30-2:30

An interactive journey experience through Laudato Si, Pope Francis' Encyclical, in order to engage with the dual reality of a throw-away culture and the beauty of our world. With a focus on community, world, and God, individuals are able to reflect on relationships as opportunities for promotion of positive change in the spirit of caring for all of creation.

## **A presentation of the Senior Visual Arts Capstone Projects**

College of Arts and Sciences: Art and Design  
Oral Presentation - Capstone Project

**PRESENTERS** Intisar Alrasheed, Emily Kelly Griffin, Veronica Renee Halfacre, Alison Marie Hiatt, Allison Teresa Perry, Jesse James Thompson, Melanie Christine Zebrowski

**ADVISORS** Tim A Wilbers

**LOCATION, TIME** Marianist Hall Learning Space Commons, 11:40-1:00

Visual Arts majors in the Department of Art and Design will present research and analysis of their individual journey culminating in creative self-directed artistic projects. Each student project is unique and reflects their selected vocations in the visual arts determined by a review of professional practices, standards and activities across related disciplines.

## **Exploring Medieval Social History**

College of Arts and Sciences: History

Panel Discussion - Course Project, 201810 HST 486 01

**PRESENTERS** Emily Grace Janowski, Joe Sutcliffe Milton, Ciaran A Minch, Cong Shao

**ADVISORS** Bobbi Sue Sutherland

**LOCATION, TIME** Kennedy Union East Ballroom, 11:45-12:45

This panel will include four papers from HST 486, each of which will address an aspect of medieval or early modern social history. Cong Shao's paper, *Children's Lives in the Middle Ages*, will consider the nature of childhood - from play to education - in the Middle Ages. Joe Milton will discuss student life in the Middle Ages in his paper entitled *Student Life at the Medieval University*. Ciara Minch's paper, "The Truth Behind Mary Queen of Scots", will consider the historical reality behind this heroine of Catholic and Scottish history, villain of Protestants. Emily Janowski will talk about the way that the medieval law surrounding raptus changed, actually resulting in women having less control over their own bodies. Her paper is entitled "Lost in Legal Reformation: How Women Were Affected by Medieval Rape Laws."

## Nostra Aetate Today: The Importance of Living out Nostra Aetate in Today's World

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Rachel Ann Nartker

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 12:00-12:20

Nostra Aetate is one of the more significant documents that came out of the Vatican II council. Though the council released it many years ago, it still is of great importance today. Nostra Aetate discusses how Catholics should view and interact with non-Catholic religions. This document was not only important in its time, but is still very important today in a world that still faces religion-based clashes. The guidelines this document offers, especially the call for dialogue, if practically followed, could be very useful in today's world, especially to the youth.

## Call to action to health communication scholars: Addressing the adolescent STD epidemic through research in developmental triggers for sexual health information seeking behaviors (HISB)

College of Arts and Sciences: Communication

Oral Presentation - Graduate Research

**PRESENTERS** Laura Combs

**ADVISORS** Angeline L Sangalang, Teri L Thompson

**LOCATION, TIME** Kennedy Union 207, 12:00-12:20

2016 marked the highest numbers of sexually transmitted infections ever recorded in the U.S. for chlamydia, gonorrhea and syphilis. Adolescents ages fifteen to twenty-four are diagnosed with half of all new transmissions of STDs and one in four sexually active females in this age range is infected with an STD. The CDC has identified this alarming transmission rate as an "epidemic accelerating in multiple populations" and one which requires a "renewed commitment from all players [state and local health departments, providers, general population]" (CDC, 2017). Health campaign designers need reliable, theory-based research developed on their target populations to create effective health messages; however research studies don't often recognize that some populations, such as adolescents, have unique needs which may require different communication strategies during different stages of their development. Recent research in HISB have shown that social determinants such as age, gender, race, education, health literacy, and financial status do influence an individual's access and use of information channels as well as her or his interest and capacity for processing that information (Galarce, Ramanadhan, & Viswanath, 2011); however no research specifically studying adolescent HISB has been published by health communication scholars. This project serves as a call to action to health communication scholars to make a more systematic study of adolescent populations and their sexual health HISB patterns. This project starts the conversation by suggesting a theory-based approach for anticipating developmental triggers for sexual health HISB which may change throughout the different development stages of adolescence. Understanding how, where, and at what age young people seek sexual health information can improve the effectiveness of sexual health campaigns aimed at this important age group.

## Assessing the Use of Cooking Demonstrations on Healthy Eating Barriers in City Bus Riders

School of Education and Health Sciences: Health and Sport Science

Oral Presentation - Independent Research

**PRESENTERS** Julianne Marie Evans

**ADVISORS** Diana Cuy Castellanos

**LOCATION, TIME** Kennedy Union 211, 12:00-12:20

Previous studies suggest that food insecure persons experience barriers regarding produce preparation and consumption. These barriers include acceptability, accommodation, availability, accessibility, and affordability. Nutrition interventions have played a positive role in overcoming these barriers. The objective of this study was to determine the effectiveness of a cooking demonstration and recipe distribution intervention on five identified barriers at a fresh produce stand in an urban bus station. This was a quasi-experimental study. Cooking demonstrations and recipe distribution was provided over a four month period at the fresh produce

stand. Bus riders who came to the demonstrations were provided a recipe and were asked to participate in a follow-up questionnaire. Consented participants were called one week after their visit and were asked to answer ten questions on the five barriers to preparing and consuming fresh produce. Additionally, open-ended follow-up questions were asked. Participants also indicated if they made the recipe. T-test and frequencies were utilized to identify barriers and compare means between participants who had and had not made recipes. A thematic analysis was completed on answers to open-ended questions. There was no significant difference between groups on the five barriers. Collectively, participants scored affordability lowest and availability highest. A common constraint for those who did not make the recipe was time. For those who did make the recipe, they indicated it was easy to follow. Continuing to develop appropriate interventions for identified barriers in convenient locations for participants is important to encourage fruit and vegetable consumption.

## **Evaluating the Effectiveness of U.S. Anti-slavery Legislation through the Lens of Supply Chain Management**

College of Arts and Sciences: Human Rights Center  
Oral Presentation - Honors Thesis

**PRESENTERS** Alexander M Mingus

**ADVISORS** Tony Neil Talbott

**LOCATION, TIME** Kennedy Union 311, 12:00-12:20

Whether knowingly or unknowingly, business supply chains are often tainted with slavery and forced labor practices. In an effort to address this reality, the California Transparency in Supply Chains Act of 2010 requires companies in California to publish a disclosure statement describing companies' efforts to prevent this potential abuse. This study evaluates the effectiveness of the California legislation by observing media trends and conducting expert interviews with business leaders, academics and legislators. This data reveals strengths and weaknesses in the California legislation, which informs future attempts to create anti-slavery legislation addressing corporate supply chain abuses.

## **Engaging Millennials & Generation Z in Cybersecurity: How to Train a Cyber-Mindful™ Workforce**

College of Arts and Sciences: Human Rights Center  
Oral Presentation - Honors Thesis

**PRESENTERS** Alexander M Mingus

**ADVISORS** Tony Neil Talbott

**LOCATION, TIME** Kennedy Union 311, 12:00-12:20

With their unique values, workplace traits, and technology-use habits, Millennials and "Gen Z'ers" are expected to dramatically impact organizations as they become the most dominant generations in the workforce. As digital natives who are always connected to their devices, these generations pose new challenges for corporate cybersecurity. This presentation will highlight the attitudes and behaviors of Millennials and Generation Z'ers regarding technology, privacy, and cybersecurity. It will also discuss the Center for Cybersecurity & Data Intelligence's preliminary research on generational differences within UD's "Cyber-Mindfulness™" engagement methodology. The researchers constructed an online questionnaire that surveyed a convenience sample of 402 college students and 47 high school seniors. They created four indexes that compared Millennials and Gen Z on cybersecurity issues. This presentation will highlight the survey's results, exploring implications and practical applications of the research.

## **Engaging Millennials & Generation Z in Cybersecurity: How to Train a Cyber-Mindful™ Workforce**

College of Arts and Sciences: Communication  
Oral Presentation - Independent Research

**PRESENTERS** James D Robinson, Thomas D Skill, Abby Papenfus

**LOCATION, TIME** Kennedy Union 312, 12:00-12:20

With their unique values, workplace traits, and technology-use habits, Millennials and "Gen Z'ers" are expected to dramatically impact organizations as they become the most dominant generations in the workforce. As digital natives who are always connected to their devices, these generations pose new challenges for corporate cybersecurity. This presentation will highlight the attitudes and behaviors of Millennials and Generation Z'ers regarding technology, privacy, and cybersecurity. It will also discuss the Center for Cybersecurity & Data Intelligence's preliminary research on generational differences within UD's "Cyber-Mindfulness™" engagement methodology. The researchers constructed an online questionnaire that surveyed a convenience sample of 402 college students and 47 high school seniors. They created four indexes that compared Millennials and Gen Z on cybersecurity issues. This presentation will highlight the survey's results, exploring implications and practical applications of the research.

## **Dayton Civic Scholars 2018 Cohort Presentation**

College of Arts and Sciences: Fitz Center for Leadership in Community  
Oral Presentation - Capstone Project

**PRESENTERS** Julia Christine Carroccio, Logan M Cobbs, Nicholas Alexander Dalton, Austin Edward Hillman, Lauren Arlene Hoody, Andrew M Kramer, Katherine Rachel Liming, John P Marron, Meghan Rose Marth, Kayla Jane McLaughlin, Maia A McLin, Kasey Anne Mulligan, Bradley Gunnar Petrella, Carlos Martin Rodriguez, Eva Justine Schuller, Emma Kathleen Welsh, Eden Kay Williams  
**ADVISORS** Hunter Phillips Goodman, Gianna Marie Hartwig, Donald A Vermillion  
**LOCATION, TIME** Kennedy Union Torch Lounge, 12:00-12:40

The 2018 Dayton Civic Scholars will be presenting their cumulative capstone. 17 students were chosen their sophomore year to join the Civic Scholars and plan a Capstone Project in partnership with a local neighborhood to benefit the Dayton area. The 2018 Cohort chose to plant a community garden in the Edgemont neighborhood, adjacent to Mount Olive Church. During this presentation, the students will share their experiences, challenges, and ultimate success.

### Rights in Jeopardy – Responses to Security Concerns

College of Arts and Sciences: Political Science  
 Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Tania Malaika Boh, Anna Julia Cribbin, Joshua Thomas Dalidowicz, Justin Kyle Dejesus, Trent E Jones  
**ADVISORS** Susan M Weaver  
**LOCATION, TIME** Marianist Hall Learning Space 217, 12:00-1:00

This panel will address the role of the United Nations in resolving national and international crises, through the discussion of five case studies of crises wherein human rights are in jeopardy.

### A Celebration of American Female Composers of the 20th and 21st Centuries

College of Arts and Sciences: Music  
 Performance - Course Project, 201810 MUS 202 01

**PRESENTERS** Mariah Joanna Berryman, Mary Catherine Donovan, Connor Patrick Fuhrmann, Megan G Green, Megan Rose Green, Ryu-Kyung Kim, Gabriella Michelle Klotz, Jillian Marie Mitchell, Nathan M Rhodes, Alaina Louise Saliba  
**ADVISORS** Ryu-Kyung Kim  
**LOCATION, TIME** Sears Recital Hall, 12:00-1:00

The University of Dayton Music Performance (MUP) Majors present “A Celebration of American Female Composers of the 20th and 21st Centuries.” The presentation will include musical performance of selected works by women composers such as Jeanine Tesori, Libby Larsen, Undine Smith Moore and Lindsey Stirling, and discussion on their impact and legacy in the history of American musical composition. While highlighting significant leaps and bounds across genres, the MUP majors will showcase compositions that have been weaved into common repertoire in musical theatre, classical song literature, instrumental works, and more, giving insight into each composer’s personal narrative.

### International Studies Capstone: Human Rights and Security in East Asia Part 1: Security and Borders Part 2: Social Inequality and Political Activism Part 3: Political Violence: State and Non-State Actors Part 4: Expression not Suppression

College of Arts and Sciences: History  
 Oral Presentation - Capstone Project

**PRESENTERS** Brittany Cheyenne Archie, Kaitlynrose Emilie Bicek, Alexis D Bovell, Devon Amelia Dubiel, Mia Elizabeth Karam, Abigail Anne Kowalczyk, Emily Clare Monczynski, Karen Najwa Naim, Bradley Gunnar Petrella, Jade Alicia Poa, Mercedes Cecelia Ramsey, Joseph Robert Schneider, Lauren Potter Stamatel, Lora Christine Vonderhaar, Cierra Lynn Waller, Emma Kathleen Welsh, Alia Francesca Whitney, Eden Kay Williams, Erin Mary Winchester, Victoria Lynn Young  
**ADVISORS** Christopher S Agnew  
**LOCATION, TIME** Kennedy Union 331, 12:00-2:40

The International Studies capstone asks students to use the knowledge and skills they have developed at the University of Dayton to produce a task force report on a critical topic of contemporary global concern. Students will collaborate as a class to develop a research plan in response to the task force prompt, analyze the relevant historical and political contexts, and provide a set of clear and specific policy proposals. This year’s task force topic is “Human Rights and Security in East Asia.” Each student has been assigned a country, analyzed a problem of critical human rights or security concern, and formulated a set of policy solutions.

### The Past is Present: Imagining Medieval Women

College of Arts and Sciences: English  
 Oral Presentation - Honors Thesis

**PRESENTERS** Kristen E Daly, Katherine R McCaffery  
**ADVISORS** Miriamne A Krummel  
**LOCATION, TIME** Humanities 118, 12:20-1:00

This Stander Symposium oral presentation will feature Kristen Daly (senior) and Katherine Mccaffery (senior) and will focus on

the results of their research and studies of women in medieval literature. Kristen will present her research and her resulting essay, "Agency in the Middle Ages," focusing on two stories, Ariana Franklin's "Mistress of the Art of Death" and "Tristan and Iseult." She will also share a short creative piece "The Daughters of the Wife of Bath," based on the torn nature of Geoffrey Chaucer's provocative Wife of Bath. Katherine will discuss the research and writing of her original play, "The Woman Behind the Lais." She will also examine the further research she has done for her Honors Thesis, which regards theories of temporality and women's writing, and specifically focuses on Marie de France's Lais.

## **Department of Art and Design, Advanced Photography Student Presentations**

College of Arts and Sciences: Art and Design

Porch Project - Course Project, 201810 VAP 410 01

**PRESENTERS** Annie Ellis Denten, Maura M Parker

**ADVISORS** Joel A Whitaker

**LOCATION, TIME** 461 Keifaber Street, 12:30-12:45

Students from the Department of Art and Design, Advanced Photography (a seminar course that examines the aesthetic, cultural, ethical, and pragmatic issues relating to photographic practice), will give presentations on their respective semester long independent photographic research projects.

## **Chant to Contemporary Music in the Catholic Mass**

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Kathleen Adeline Zahn

**ADVISORS** William H Johnston

**LOCATION, TIME** Humanities 122, 12:30-12:50

This talk will cover a brief history of Gregorian chant and its use in the mass, including an overview of the chapter on liturgical music in Vatican II's "Sacrosanctum Concilium" (1963) and key passages in the U.S. Catholic Bishops' document "Sing to the Lord" (2007). It will then discuss the contemporary music that is currently used in mass today by the worship team at the University of Dayton Chapel. Finally it will discuss if we have lost the culture of chant in mass and then discuss how we can move forward in reincorporating chant into mass while still allowing contemporary music in the mass.

## **Social Support for LGB College Students**

College of Arts and Sciences: Communication

Oral Presentation - Course Project, 201780 COM 562 02

**PRESENTERS** Irina Enevska, Karen Mikaela Lucashu Ryner

**ADVISORS** Angeline L Sangalang

**LOCATION, TIME** Kennedy Union 207, 12:30-12:50

Considering the growing mental and physical health problems faced by lesbian, gay, and bisexual individuals in the United States, universities should implement more methods to help students overcome their difficulties. The paper focuses specifically on Ally Training, a free program offered by the University of Dayton, available to students, staff, and faculty. The training is designed to educate individuals on how to better support lesbian, gay, bisexual, transgender and queer individuals (the LGBTQ+ community). The present paper will discuss the mental and physical health problems associated with lesbian, gay and bisexual individuals' lack of emotional and social support. It examines the Transtheoretical Model, which provides insight on to how to encourage students to attend training. Finally, it discusses the need for creating an effective health campaign and spreading awareness. Keywords: lgbtq+, college students, transtheoretical model, emotional support, social support, mental health

## **Affecting the Wingtip Vortex by Influencing Wing Surface-Flow Direction**

School of Engineering: Mechanical and Aerospace Engineering

Oral Presentation - Independent Research

**PRESENTERS** Nathan Robert Thomas

**ADVISORS** Sid Gunasekaran

**LOCATION, TIME** Kennedy Union 211, 12:30-12:50

The aerodynamic efficiency of a NACA 0012 AR 4 wing was affected through periodic contours aligned in the flow direction resembling a "wrinkled" texture. Streamwise and cross-stream Particle Image Velocimetry (PIV) were conducted at the University of Dayton Low Speed Wind Tunnel around Reynolds number of 135,000 on the NACA 0012 AR 4 wing with and without surface contours. Wings with 6 contour sections was designed by spline fitting two NACA 0012 airfoil profiles in the spanwise direction. Both 2D (wall-to-wall model) configuration and 3D configuration of the wings were tested to determine the effects of surface contours on the parasite and induced drag of the wing. Streamwise PIV results indicated an increase in momentum deficit in the wake of the mid-contour region due to enhanced boundary layer separation from the upper surface of the mid-contour region. The cross-stream PIV results indicated a decrease in the magnitude of azimuthal velocity, circulation and RMS quantities in the wingtip vortex with the surface contours. The reduction in the wingtip vortex properties indicates that the contours were effective in blocking the spanwise

flow feeding into the wingtip vortex on the surface of the wing.

## Investigating the synaptogenic effects of the rapid-acting drug ketamine in the female mouse hippocampus

College of Arts and Sciences: Biology

Oral Presentation - Independent Research

**PRESENTERS** Emily Margaret Flaherty, Joey Edward Saurine, Connor F Thelen

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** Kennedy Union 311, 12:30-12:50

Major depressive disorder (MDD) is a debilitating neuropsychiatric disease and affects more than 350 million individuals worldwide. A phenotypic characteristic of MDD, the atrophy of dendritic spines, most often presents itself in brain regions implicated in stress response (e.g. prefrontal cortex and hippocampus). Directly combating these neural deficits, the rapid-acting antidepressant drug ketamine has been shown to induce its therapeutic effects by enhancing synaptogenesis and increases in dendritic spine density in the male rodent brain. Although the antidepressant efficacy of ketamine has been validated, the majority of research has been conducted almost exclusively in males. Published and preliminary data from our group and others suggest that female mice are behaviorally more reactive to the antidepressant-like effects of ketamine; however, the mechanisms responsible for the female sensitivity to ketamine are still not characterized. In the context of a Stander Undergraduate Fellowship a modified Golgi-Cox neurohistological staining technique was used to evaluate the temporal synaptogenic effects of a single dose of ketamine in the cornu ammonis 1 (CA1), CA3 and dentate gyrus (DG) hippocampal subfields of male and female mice. Overall, we found that single dose of ketamine (10 mg/kg) that induces both rapid and sustained antidepressant-like effects in both sexes of mice elicits time and sex-dependent synaptogenic effects in the different hippocampal subfields in male and female mice. These findings further support the premise that ketamine induces its antidepressant-like effects in a sex-specific manner and that the HIPPO may play a critical role in mediating the antidepressant effects of ketamine in the female sex.

## Probabilistic Modeling of Student Interaction during a Passing Period at the University of Dayton

College of Arts and Sciences: Mathematics

Oral Presentation - Honors Thesis

**PRESENTERS** Allyson J Pacifico

**ADVISORS** Ying-Ju Chen, Peter W Hovey

**LOCATION, TIME** Kennedy Union 312, 12:30-12:50

The University of Dayton is composed of five colleges and schools: College of Arts and Sciences, School of Law, School of Business Administration, School of Education and Health Sciences and School of Engineering. The University of Dayton is composed of about 11,000 students on campus who all have distinct class schedules and paths they take between their classes. In this study, I wanted to know the probability of meeting my friends with a different class schedule as I walk between classes. The data consisted of one to two students from each college, except for the School of Law, who documented their paths on a modified campus map for a week. Using R, the simulation randomly selects two paths from the data, generates a random time between each node and compares the time of the identical nodes to see if the students were to have met.

## Electrochemical Quartz Crystal Microbalance Studies of Lignin in Aqueous Solutions

School of Engineering: Chemical Engineering

Oral Presentation - Independent Research

**PRESENTERS** Grace Ann Docken, John Flynn

**ADVISORS** Erick Vasquez

**LOCATION, TIME** Marianist Hall Learning Space 218, 12:30-12:50

An Electrochemical Quartz Crystal Microbalance (EQCM) uses an electric potential to induce oxidizing or reducing conditions for electrochemical synthesis and analysis. One application of EQCM applies a series of voltages to a sample and measures the corresponding current generated in the solution being analyzed. This application, known as Cyclic Voltammetry (CV), provides insight into properties such as molecular mass, impedance, and film thickness. Both EQCM and CV have been used in the characterization of polymers and various biomaterials. In this study, lignin—a naturally occurring polymer—was deposited on gold-coated substrates in a buffer solution. The corresponding lignin thin-film was characterized at various concentrations in the presence of a reducing agent, thus altering the pH of the buffer solution. The effect of ascorbic acid and polyvinylpyrrolidone (PVP) as reducing agents on the assembly of lignin to gold substrates was measured using EQCM and CV. With this study, we can determine the redox properties of lignin in various aqueous solutions of differing pH. These results provide insight into the conditions required for lignin self-assembly under a pH-controlled environment.

## How Trustworthy is She?: Perception of International Students Toward International Peer Tutors in Writing Centers

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Raheem Terrell Rashawn Elmore, Romaisha Rahman

**ADVISORS** Bryan A Bardine, Jennifer E Haan, Andy Slade

**LOCATION, TIME** Humanities 110, 12:30-1:10

Working as a writing center graduate peer tutor for almost two years now, I have, at times, faced situations where I had to work hard to establish my credibility with the client. The most surprising, yet funny, thing is that I did not encounter this issue with any native speaker of English but with the people who speak English as their second language-- just as I do. The domestic students have appeared to be more comfortable in working with me than some of the international students. I began to wonder why this was happening, and if I was the only international peer tutor facing such issue. One thing that I have learned from majoring in Linguistics, which I have also embraced with openness, is that the flame of curiosity is what leads to the greatest of discoveries. With that idea in mind, I started to ask around. I also had a conversation with my supervisor about this issue and came to know that previous international student employees have also faced similar situations with students who shared the same native culture as them; the students who spoke the same native tongue. This strange phenomenon interested me to such a great extent that I decided to research it; soon after, it became the topic of my Master's thesis. I am currently pursuing my Master's degree in English with a concentration in TESOL and have chosen "Perception of International Students Toward International Peer Tutors in Writing Centers" as my thesis topic. Since this biased phenomenon is a recurrent one, my research has tried to answer "why" this event takes place. From the research findings, it can be concluded that this phenomenon occurs due to the presence of native speaker fallacy; also, this native speaker fallacy is exhibited differently by different cohorts of students--giving native speaker fallacy two entirely different definitions.

### **Fabricate nanogap-rich plasmonic nanostructures through an optothermal surface bubble in a nanoliter droplet**

College of Arts and Sciences: Physics

Oral Presentation - Graduate Research

**PRESENTERS** Farzia Karim

**ADVISORS** Chenglong Zhao

**LOCATION, TIME** Fitz Hall 580, 1:00-1:20

This project focuses on the development of a rapid and cost-effective method for the fabrication of nanogap-rich plasmonic nanostructures. Novel metal plasmonic nanostructures have been studied extensively due to a wide range of practical applications especially in biology and medicine. Strong coupling between the free electrons in plasmonic nanostructures and incoming light; the so-called plasmonic resonance provides a large electromagnetic field enhancement. Further field enhancement can be carried out through the combination of individual plasmonic nanostructures. This will increase the electromagnetic coupling in the gaps of nanostructures and form a nanogap rich plasmonic nanostructure. However, most of these nanostructures are fabricated through time-consuming top-down nanofabrication or bottom-up synthesis process which cannot provide the requirement for a cost-effective and rapid preparation of nanogap-rich plasmonic nanostructures. Moreover, a special absorptive layer is required to form these structures, which restrict the substrates type. In this project, an affordable nano-manufacturing method has been executed to rapidly prepare nano-gap rich plasmonic nanostructures at any desired location on a substrate. This method works based on laser-induced heating of gold nanoparticles (GNPs) and uses Marangoni convective flow around an optothermal surface bubble inside a nanoliter droplet. GNPs act here as efficient nano-heating source and used as the building blocks for the rapid fabrication of closely-packed GNPs under ambient conditions. So, no special absorptive layer is required which overcomes the limitation on the type of substrate. Moreover, GNPs are confined in a droplet of nano-liter size that can significantly reduce the consumption as well as contamination of sample and confines the liquid flow. This method will enable a broad range of applications such as bio-sensing, surface-enhanced Raman spectroscopy (SERS), environmental analysis, and nonlinear optics.

### **Three Strikes Against Her-She was Black, a Woman, and a Pentecostal: Ida Bell Robinson and the Mount Sinai Holy Church of America, Inc. (1924-1946)**

College of Arts and Sciences: History

Oral Presentation - Graduate Research

**PRESENTERS** Dara S J Delgado

**ADVISORS** William V Trollinger

**LOCATION, TIME** Humanities 122, 1:00-1:20

Ida Bell Robinson is a relatively unknown twentieth-century American Pentecostal pioneer. Essential to this story is the recognition that Robinson was a Black woman brazenly asserting herself into a role typically reserved for men, within a religious tradition socially rejected and deemed as scandalizing and unseemly. In this, Robinson had three strikes against her: she was Black, she was a woman, and she was a Pentecostal. Despite all of that, Robinson eschewed social constructs of womanhood--even the insufficient form that was available to her as a black woman during this era--as well as the traditional roles set aside for black women. As such, "Bishop Robinson" took to the road overseeing churches affiliated with her ministry and planting new churches to draw more disciples. Moreover, when she was not acting in the role of "bishop," Robinson was mentoring other women to be leaders, managing a radio program, publishing a denominational newsletter, and acquiring properties. Her work also included a social awareness that sometimes took its form in her sermons. Specifically, through the art of preaching Robinson addressed lynching, economic and racial



injustice, and the war—which landed her on the FBI list. Therefore, with careful consideration to how Robinson, seemingly unbothered by the very real social and religious glass ceilings of her day, established the MSHC which she led until her death in 1946, this paper will explore how she, as a Black woman in the early twentieth-century, created a religious denomination with the purpose of empowering women to lead mixed-gendered congregations and to occupy the highest positions of ecclesial authority and government. Moreover, I will argue that Robinson's story has much to say about Black Holiness-Pentecostal history, Black history, and American women's and religious history.

## Rapid Prototyping and Development for The Internet of Things

School of Engineering: Engineering Management, Systems, and Technology

Oral Presentation - Course Project, 201810 ECT 465 01

**PRESENTERS** David Alexander Alfano

**ADVISORS** Mohammadjafar Esmaeili

**LOCATION, TIME** Kennedy Union 207, 1:00-1:20

Development for and around internet connected devices and sensors has exploded over the past two years, and as a result companies are rushing to bring new connected devices to market. Rapid prototyping of product concepts is a crucial part of this process, and there are a variety of free and low cost tools available to aid engineers, developers, and individuals with prototyping. This presentation will focus on the \$35 Raspberry Pi single board computer and the free Node-RED graphical programming suit to demonstrate the speed and ease with which ideas for internet connected devices can be implemented, proved, and tested, both on a hardware and software level. Participants will leave this presentation with the knowledge needed to obtain data from a variety of sensors and then analyze, visualize, and store that data to the cloud.

## Colonization to Globalization: French-Algerian Integration Analysis from Historical, Societal, and Economic Perspectives

College of Arts and Sciences: Global Languages and Cultures

Oral Presentation - Honors Thesis

**PRESENTERS** Stephanie Soledad Rodriguez

**ADVISORS** Nicola C Work

**LOCATION, TIME** Kennedy Union 311, 1:00-1:20

This cross-disciplinary research on French-Algerian relations is designed to expose the influence of historical, societal, and economic perspectives on the present and future of cultural and economic integration. Using a multi-disciplinary approach to analyze French-Algerian integration, this research comprehensively leverages seemingly unrelated factors that have impacted the transition of France-Algeria from European colonization to African globalization. In this work, their colonial history and statistics on population, immigration, and employment are used to introduce the development of French-Algerian relations. Using demographic data on French and Arabic language usage and Islamic religious affiliation, as well as surveys on immigrant national identity, this research considers French and Algerian government policies that shaped the development of their economic relations. As Algeria currently seeks economic diversification in a time of declining oil prices and current French politicians recognize the need to ameliorate France's relationship with Algeria, this work describes cooperation opportunities for both France and Algeria that could result in long-term societal cooperation and economic stability.

## Autobiographical Memory Recall in Spanish-English and English-Spanish Bilinguals

College of Arts and Sciences: Global Languages and Cultures

Oral Presentation - Honors Thesis

**PRESENTERS** Hannah N Klein

**ADVISORS** Jorge Aguilar-Sanchez

**LOCATION, TIME** Kennedy Union 312, 1:00-1:20

Research in bilingualism continues to morph over time in distinctive manners, especially in conjunction to the area of memory and its relationship to language. Various studies have been conducted in accordance with developments in autobiographical memory research and foreshadow the possible connections that language has to personal memory. This study seeks to further understand how these two human characteristics interact, specifically in Spanish-English and English-Spanish bilinguals. It focuses on whether a particular language aids in the recall of memories. To achieve this, I study how participants relay autobiographical memories in oral interviews. Participants are cued to recall particular moments in their past. Interviews are transcribed and memory recalls are coded. Data are analyzed to find any correlation between the language used to recount and the event type. It is expected that the recollection of these events will be different and that the dominant language of the individual will not only affect recall, but also the way in which events are communicated.

## College Students' Perceptions of Urban Crime

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Jennifer Marie Sloan

**ADVISORS** Martha Henderson Hurley

**LOCATION, TIME** Marianist Hall Learning Space 218, 1:00-1:20

Students' safety on college campuses has been a concern in research for many years. Students at urban, rural, and community colleges have different perceived levels of safety based on a number of personal and contextual factors. Previous literature on this subject typically focuses on students' level of fear of risk of victimization on college campuses. However, this does not explain students' fear of the community in which their university is located. The purpose of this project is to examine these perceptions of crime in the community, based on a study of students at the University of Dayton. By examining their perceptions of crime at the university and surrounding Dayton community we can recognize existing stereotypes of urban populations and understand the extent to which a student's education, background, and family demographics influence their perceptions of urban crime and safety.

### **Lending Club's Note Trading Platform Facade: An Examination of Peer-to-Peer (P2P) Lending Secondary Market Inefficiency**

School of Business Administration: Economics and Finance

Oral Presentation - Honors Thesis

**PRESENTERS** Stephen Key Harvey

**ADVISORS** Tony S Caporale

**LOCATION, TIME** Miriam Hall 209, 1:00-1:20

Peer-to-Peer (P2P) lending is the practice of matching borrowers and lenders through a third-party, such as Lending Club, allowing for lenders to pool their funds together to match the need of a borrower. Those who pledge funds to a borrower receive a note proportional to their invested amount. After a loan closes, lenders may choose to sell their notes on a secondary market. These secondary markets allow for the lender to set a price and auction their notes. Through an analysis of Lending Club's secondary market (Note Trading Platform), it can be determined that this method of price setting often causes prices to be misaligned to the true value of notes. This results in an inefficient secondary market where the majority of notes posted for auction are never purchased; leaving lenders with a potential level of liquidity that is not met.

### **MIS CapstoneMidmarkInformation Technology Operations Dashboard**

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Armando Alonso, Seth N Bensman, Boyu Fan, Kara Ayanna Goodwin

**ADVISORS** Stephen Russell Hall, Sukhdev Nanda

**LOCATION, TIME** Miriam Hall 207, 1:00-1:30

MIS Senior Capstone ProjectFor Midmark, our goal is to create a live dashboard that incorporates various desired IT metrics to be displayed on TV monitors and made accessible from a network connected PC. An electronic dashboard is the desired final outcome that pulls data from sites used by Midmark to benefit their IT team when working within the company. Midmark traditionally uses waterfall methodology but is transitioning towards agile method. That being said, we as a team are going to use an agile method to go along with their current trend within the company. We will be working directly with Jeff Reed for the project and contact but there will be others from various departments in Midmark who help us determine what is useful or not when it comes to the design of the dashboard. Our current idea for creating the dashboard is to use an external program such as PowerBI or Smartsheets, which pull data from numerous sites allowing you to put different metrics into a dashboard while it updates in real time.

### **Grow Up, Not Old: The Perspectives of Caregivers in an Anti-Aging Society**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Mary Lucy Hoffman

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

From 2012 until 2050, the United States is projected to experience significant changes in its age structure, which will render the population of citizens age 65+ the leading age demographic within society (Ortman, 2014). In response to a rapidly aging nation, this study aims to examine individual perspectives towards the social and psychological effects of the anti-aging construct (i.e. the construction of a social movement which rejects the process of aging and devalues the lives of elderly individuals) and its prevalence (i.e. the scope and magnitude of the anti-aging construct) within eldercare environments and for caregivers employed within the eldercare industry. To do this, a series of interviews have been conducted with multiple individuals that occupy a formal caregiving role. The results of this research will be discussed in the context of qualitative analysis, drawn from specific interview content. Additionally, the societal implications of these research findings will be discussed.

### **The Expression of Depression: The Role of Depression Forums in the Representation of Depression**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Mary Angeline Macrae

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

There is a growing body of research examining the relationship between social media and mental health. Multiple studies suggest a link that increases in social media consumption is associated with declines in mood, sense of well-being, and overall life satisfaction. This research examines the mental health problems of depression and how that relates to social media usage. Using a content analysis of popular online depression forums, this study investigates depression, social media, and online expression. The findings from this research can help provide clarity on depression and social media, which can be used to inform future prevention and intervention forums and programs.

## **Why Do You Drink? Drinking to Cope as a Result of Anxiety and Depression Among College Students**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Megan Marie McDowell

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

Alcohol is often seen as a social and inevitable aspect of the college experience. However, there are students who use alcohol as a way to cope with feelings of both anxiety and depression. The purpose of this study is to determine whether there is a connection between drinking to cope, and anxiety and depression among college students at the University of Dayton. To gather the information necessary for this study, University of Dayton seniors were asked to complete an online anonymous survey about both their drinking habits and any possible feelings or signs of depression and anxiety within the last year. This study looks at gender differences, social anxiety, reasons for drinking as much as they do, and consequences that could occur as a result of such drinking habits. This study can help college students understand and be aware of drinking to cope signs within their own lives or in the lives of others.

## **Social Influences of Substance Abuse Relapse**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Gabriela Ana Milos

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

Substance use is a major problem in the United States, emphasized even more recently by the opioid epidemic. Even after entering treatment, it is common for people who are addicts to relapse. Many professionals contend that relapse is a natural part of the recovery process. There are, of course, factors pertaining to individual traits that contribute to relapse. This project examines the perspectives of social work professionals in the field of substance abuse recovery and what they view are the social influences of relapse. Findings from this research will connect to factors, such as family attachment and support, work commitment, respect for authority, social interest, social bonding, religious commitment, and conventional beliefs.

## **And How Does That Make You Feel?: Emotional Wellness of Resettled Refugees in the U.S.**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** BreAnn Mahannah Hill

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 1:00-2:00

From July 2015 through July 2016 the United States welcomed 84,995 refugees from around the world; many of these refugees escaped trauma and violence from their native country. Leaving one's home country has the potential to be a traumatic experience which can have a lifelong impact on mental health. The purpose of this study is to further understand the support systems in place for how refugees in the United States take care of themselves mentally and emotionally after they have been resettled. This study examines interviews with experts on refugee resettlement in Dayton, Ohio, including those who work at social service agencies that provide aid to refugees. The interviews are analyzed for both content and themes that reflect coping strategies used by refugees. The findings highlight the importance of understanding trauma informed care and why this approach can be beneficial to resettlement agencies in order to address emotional wellness of resettled refugees.

## **Building Historical Literacies in Secondary School Students (1 of 2)**

School of Education and Health Sciences: Teacher Education

Panel Discussion - Course Project, 201810 EDT 323 01

**PRESENTERS** Stephen Bucior, Lexie Marie Danch, Ben Peter Gauthier, JalyN Gilbert, Shaylynn Aire'On Hespeth, Ciaran A Minch,

## CHRONOLOGICAL ORDER

Patrick Andrew Munhall, Elizabeth Ann Randall

**ADVISORS** John J White

**LOCATION, TIME** Kennedy Union Torch Lounge, 1:00-2:00

Our panel presentation will demonstrate strategies to increase historical literacy in a secondary school history classroom. We will illustrate the difference between historical knowledge and historical literacy by presenting our research on methods of teaching designed to increase historical thinking skills. Several practices that teachers should employ to teach students how to analyze historical texts using historical literacy methods will be discussed, including sourcing, close reading, corroboration, and contextualization. Having read deeply into the historiography of the Irish Famine, and after examining the famine curricula in New York and New Jersey, we will discuss how sources such as memoirs, folklore, newspaper, and government documents provide valuable insight into the heuristics that historians use when constructing a historical narrative. High school students should begin to understand and develop these heuristics after a thorough examination of the primary and secondary sources used throughout school texts and curricula facilitated by critical discussion and guidance from the teacher; we will specifically target the epistemic stance and cognitive meta-concepts used by historians.

### Environmental Crises – Impact on Human Rights and Security

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Connor Wray Boyle, Joanna Waltraud Gisel, Clare M Manion, Betsy R Mazza, Austin Wishart Jordan Wishart

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 1:00-2:00

Through the discussion of five case studies, this panel will confer on the role of the United Nations in addressing environmental concerns and crises, and the resulting impact of these predicaments on human rights and security.

### SBA BESST Program - Highlights & Discussion Business Experience San Fransico & Silicon Valley A Unique & Robust Intersession Course and Program

School of Business Administration: Management and Marketing

Panel Discussion - Course Project, 201780 MKT 494 N1

**PRESENTERS** Katie Ann Dombrowski, Giavanna Marie Facchiano, Alex Anthony Geiger, Emily M Lawton, Katherine Elise Olifrowicz, Myra Lee Peterson, George Albert Sechrist, Rehan Amin Syed, Andrew Szappanos, Emma Catherine Welge, Nicolette Ann Westberg

**ADVISORS** Irene J Dickey, Tracy K Miller

**LOCATION, TIME** Miriam Hall 101, 1:00-2:00

UD is about community and that community extends well into a robust business community of alumni working at amazing companies in San Francisco and Silicon Valley. Join the students who visited 13 companies including Fit Bit, LinkedIn; Google, Tesla, NASDAQ and Salesforce. This program brings their intercession experience to life with a video presentation and a Q & A. Follow-up work includes reflection work and a video project highlighting Alumni Leaders, company visits, events with Alumni Leaders, and other excursions. Students will share their experiences visiting with alumni and their colleagues and touring these companies. They will discuss their insights into networking events, meaningful discussions with alumni leaders, tours, and the network and community they built with the professionals they connected with!

### OPS 495 Capstone Project Presentations (Part 2 of 3)

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Sean Andrew Alexander, Steven Phillip Almeida, Breanne Marie Beitman, Yihan Cai, George Breen Cleary, Alyssa Frances Giese, Joseph Michael Ginley, Alayna Ashley Gornic, Sarahjane Hannibal, Christopher Patrick Harrison, Devin Michael Joss, Mary-Beth Elizabeth Macklin, Kayla Jane McLaughlin, Matthew E Moore, Nicolas A Paxson, Anne Marie Whalen, Zachary Robert Wilker

**ADVISORS** Michael F Gorman, Robert A Kinion

**LOCATION, TIME** Miriam Hall 103, 1:00-2:00

Senior Operations and Supply Management majors present the results of their Capstone Projects.

### ACC 602A - Information Assurance Presentations on Analytical Procedures (Part 1)

School of Business Administration: Accounting

Oral Presentation - Course Project, 201810 ACC 602A 01

**PRESENTERS** Aidan John Butler, Caitlin Rose Cantwell, Peter Michael McNeely, Maggie Roller

**ADVISORS** Marsha K Keune

**LOCATION, TIME** Miriam Hall 104, 1:00-2:00

Master of Professional Accountancy students present the results of a class project utilizing Tableau, a data visualization tool, to develop, evaluate, and communicate analytical procedures commonly performed by external auditors.

## 16th Annual Integration Bee, Mathematics

College of Arts and Sciences: Mathematics

Interactive Competition - Independent Research

**PRESENTERS** Vicki L Withrow

**ADVISORS** Arthur H Busch, Maher B Qumsiyeh

**LOCATION, TIME** Science Center 255 - Chudd Auditorium, 1:00-2:00

The students compete in teams of 2-3 people. This is organized in a similar way to the traditional spelling bee. Teams will be evaluating integrals that are projected on a screen. If a team incorrectly evaluates an integral, the team is eliminated from the competition. After the elimination rounds, we will hold the lightning rounds. The first 'y' many teams to correctly evaluate the given integrals will proceed to the next round. We do this until there is a 1st, 2nd, and 3rd place team. First, second, and third place teams will receive math t-shirts. The department of mathematics will host a pizza lunch in the Science Center Atrium from 12:00-1:00 PM prior to the Integration Bee.

## Locating Human Rights in Dayton, Ohio: Stories of Global Ideas in Local Context

College of Arts and Sciences: Political Science

Visual Arts Exhibition - Course Project, 201810 POL 431 P4

**PRESENTERS** Taylor Lee Alexander, Mayra Arlet Baeza, Jessica Nicole Bien, Tania Malaika Boh, Jessica Rose Burnham, Allison Charlotte Burns, Rachel Elizabeth Carr, Emma E Coning, Alex Luck Curtin, Annie Ellis Denten, Rose Eileen Dyar, Claudia Grace Ferguson, Hannah B Gahimer, Maia Ann George, Isabel Cristina Gerardino, Maria Rosario Gordon, Alexandria Erin Graig-Tiso, Emily Kelly Griffin, Veronica Renee Halfacre, Julianne Elizabeth Kalec, Kayla Elizabeth Kingston, Maddie Rose Kurlandski, Chloe Elizabeth Massie-Costales, Mary E McLoughlin, Elyse Marie McMahon, Joe B Mondri, Anna M Mumma, Kerri Nicholson, Taylor Christine Orr, Maura M Parker, Corrie A Pfeiffer, Jade Alicia Poa, Joel Richard Pruce, Brittany Nicole Resar, Rose Quinn Reynolds, Claire Michelle Rotter, Shannon K Roy, Josh Aron Segalewitz, Cong Shao, Thomas William Singel, Jennifer Ann Sobnosky, Sylvia Stahl Marie Stahl, Elizabeth G Strati, Taylor Kate Tovey, Destiny Watson, Zach Shawn Weigel

**ADVISORS** Natalie F Hudson, Glenna Marie Jennings, Joel Richard Pruce

**LOCATION, TIME** Roesch Library Collab Space, 1:00-3:00

"Human rights" is a global vocabulary used to describe the experience of marginalization and suffering. Communities facing violence or discrimination utilize human rights discourse to articulate claims for accountability, as a way to ask for help or demand a remedy. Because of the way in which human rights are documented in international law, "human rights" is endowed with a degree of authority and legitimacy that makes it an appealing framework for those seeking recognition. But, what does "human rights" mean in Dayton, Ohio? Does it inform social justice work in this context? Has the language trickled down from the global to the local? Does human rights have roots or origins that are actually closer to home? Does it resonate with individuals engaged in efforts to protect human dignity in our own backyard? If so, why? If not, why not? What can we learn about the power, as well as the limits, of human rights by investigating how it takes form in the practices of those committed to promote equal respect for all people? The purpose of this project is to examine the existence and meaning of human rights in local advocacy. To initiate this investigation, student teams identified individuals and/or organizations active in the city of Dayton working in a field or on an issue that addresses human welfare. Team members conducted interviews and took photographs of their subjects, and created a multimedia presentation, illuminating the backstory and the work of those individuals seeking to make a difference in the lives of people in Dayton. The question of human rights animates the project by providing a context within which to analyze and understand the work of local actors.

## Department of Music Honors Recital Auditions

College of Arts and Sciences: Music

Performance - Honors Thesis

**PRESENTERS** Anna Margaret Ford, Connor Patrick Fuhrmann, Graham Mitchell Hardert, Aubrie Nicole Hattendorf, Gabriella Michelle Klotz, John Dylan Newcomb, Christine Elizabeth O'Keefe, Alaina Louise Saliba, Timothy Daniel Schroeder, Elizabeth Mary Turnwald, Caleb George Vanden Eynden, Sarah Christine Whitehouse

**ADVISORS** Tobias William Rush

**LOCATION, TIME** Sears Recital Hall, 1:00-3:00

Each student majoring in music at the University of Dayton performs once every semester at weekly department recitals, where they share their hard work and talent with their faculty and peers. Faculty are invited to score these performances. The twelve highest-scoring student performers are invited to audition for the UD Honors Recital on April 27, 2018. These auditions take place as part of the University's Stander Symposium and are free and open to the public.

## Participatory Community Action Research in Homeless Shelters: Applications of Behavioral Activation and Service-Learning Pedagogy

College of Arts and Sciences: Psychology

Panel Discussion - Course Project, 201810 SSC 200 01

**PRESENTERS** Megan Marie Barry, Natalie Jane Bayer, Barbara Holland Bobal, Karla Leigh Borgerding, Ben Scott Breh, Jessica L

## CHRONOLOGICAL ORDER

Bullock, Julia Christine Carroccio, Benton A Carter, Mara Adrian Coffey, Lauren Julia Declark, Anika Shea Desloge, Katherine Ann DiGiandomenico, Justin Willem Dorr, Hannah Payton Dunne, Nathan L Epprecht, Will Fehribach, Marie Hermine Feyche, Katheryn Elizabeth Gerling, Katey M Gibbins, Kathryn Anne Godfrey, Ashley Marie Grassan, Michael Robert Gross, Cassandra L Hartman, Stephanie J Herbst, Lauren Arlene Hoody, Jill Marie Hubert, Amanda Rose Imbrogno, Kelsey Michelle Julian, Becca Frances LeBouef, Mingqing Luo, Jack Jeremiah McCormick, Gabriela Ana Milos, Garrett Stephan Neu, Dylan Anthony Penna-Powell, Isabella Perez, Dana Lynn Pflugradt, Alexander Bonne Posma, Alex Jordan Reynolds, Lucas Charles Sadenwater, Anna Grace Schlegel, Mallory Hope Schrier, Megan Elizabeth Schuman, Tom Gregory Schweikert, Alicia Michelle Selvey, Landis Yuri Soto, Katie Barbara Stumpf, Emma Rutledge Venetis, Qi Wang, JD Dennis Webb, Joe Reed Weeks, Sara Elizabeth Wetter, Megan Elizabeth White, Tori C White, Lindsey Grace Whittemore, Asher Jacob Williamson, Mallory Rose Zalla, Le Zhang, Bin Zhou, Jennifer Leigh Zicka

**ADVISORS** Greg C Elvers, Charles Allan Hunt, Roger N Reeb

**LOCATION, TIME** Kennedy Union East Ballroom, 1:00-3:00

This transdisciplinary project, guided by the Psycho-Ecological Systems Model (PESM; Reeb & Folger, 2013), implements behavioral activation at homeless shelters, sponsored by St. Vincent de Paul (Dayton, Ohio), for men and women. Utilizing a participatory community-action research strategy with a service-learning pedagogy the project attempts to integrate the undergraduate student population within the greater Dayton community. Rooted in Skinner's operant conditioning, behavioral activation is defined "as structured attempts to increase overt behaviors that bring an individual into direct contact with opportunities for response-contingent reinforcement and thereby produce improvements in his or her quality of life, mood, thoughts, and empowerment to recognize and pursue personal potential" (Hopko et al., 2003). Behavioral activation sessions are designed to (1) enhance the shelter guests' empowerment, (2) strengthen their coping skills/capacity, and (3) improve the social climate of the shelters. Results indicate that guests find behavioral activation sessions to be important, meaningful, worthy of repeating, and enjoyable. Findings also suggest that guests perceive behavioral activation sessions as contributing to their overall levels of hope, mood, empowerment, social support, positive social climate perceptions, purpose/meaning in life, and quality of life. In addition to presenting quantitative and preliminary qualitative results from research on the project, we will discuss a number of extensions of the project to different settings, such as the newly developed Urban Gardening Initiative and continued collaborative partnership with the Montgomery County Office of Reentry. Lastly, student research assistants will be serving as panelists to present and discuss their experiences while working on the project within the greater Dayton area homeless shelters. Specifically, they will be addressing their perceived ability to act as an agent of change within the community, the changes in perception of homelessness and homeless individuals, and their perception of the stigma, oppression, and discrimination faced by homeless individuals.

### Fine arts thesis presentations

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** Marie E Cossins, Mary Elda Rose Cregan, Olivia Nicole Garzona, Mariamelia Miranda, Taylor Christine Orr, Meghan E Sismour

**ADVISORS** Jeffrey C Jones

**LOCATION, TIME** Marianist Hall Learning Space Commons, 1:10-2:10

Presentations of fine arts senior research.

### Construct Finite Fields with a Finite Elements

College of Arts and Sciences: Mathematics

Porch Project - Capstone Project

**PRESENTERS** Junyu Lin

**ADVISORS** Andres Larrain-Hubach

**LOCATION, TIME** 461 Keifaber Street, 1:15-1:30

A field is a set with two commutative operations called sum and product, such that every nonzero element has a multiplicative inverse. For example, the rational numbers form a field but the integers do not. In this talk, I will show how to construct fields with a finite number of elements. If there is enough time, I will show some results concerning polynomials on these "finite fields".

### Community Engagement in the Linden Heights Neighborhood: Bringing a Community Together with Nature Play

College of Arts and Sciences: Fitz Center for Leadership in Community

Oral Presentation - Capstone Project

**PRESENTERS** Luke Mark Bachmann, Madalyn Ann Beban, Cameron Allen Cerbus, Alexandra Margaret D'Angelo, Jason Demeter, Sarah Marie Fieldhammer, Julia Kristin Hall, Abigail Anne Kowalczyk, Corey Michael Kuminecz, Meg Eileen Maloney, Emily Patricia McAleese, Christian Michael Medina, Ana Donnatella Ritz, Tia Alissa Ritz, Cody Samuel Ruffing, Megdalene B Stirn, Aaron John Svidunovich, Lori R Zagar

**ADVISORS** Leslie W King

**LOCATION, TIME** Kennedy Union 310, 1:10-1:30

River Stewards, a multidisciplinary leadership program through the University of Dayton's Fitz Center, focuses on civic engagement,

protection of the Great Miami River Watershed, and service. As part of the 3-year commitment to the program, each River Stewards cohort designs and implements a Capstone Project. The 2018 cohort has composed a plan, scheduled to be carried out in March of 2018, to create an outdoor playground composed of natural materials called a "Nature Play." Located in the Linden Heights neighborhood, the Nature Play is intended to provide a space for kids, and the general populous of the neighborhood, to connect with nature in a way they might not have been able to otherwise.

### **Building a high temperature 4-point probe to study GST phase transition material**

School of Engineering: Electro-Optics and Photonics

Oral Presentation - Graduate Research

**PRESENTERS** Pengfei Guo

**ADVISORS** Imad Agha, Andrew M Sarangan

**LOCATION, TIME** Fitz Hall 580, 1:20-1:40

Phase change materials (PCM) use the reversible phase change between crystalline and amorphous phases by Joule heating via electrical or optical sources. The chalcogenide material GST is the focus of this work. This material has different optical and electrical properties in amorphous and crystalline phases, allowing it to be used in optical and electrical switching devices. Such as reconfigurable phase retarders and polarizers. We are going to build a high temperature probe to study the resistivity of the deposited GST films. The electrical properties of thin films are determined by their chemical composition, the content and type of impurities in the thin film or on its surface, crystal structure of the thin film and the types and density of structural defects. The measurement of thin film sheet resistivity via two point probe method which inadvertently introduces errors due to probe resistance, spreading resistance and contact resistance between probing tips and the samples. On the other hand, the commercial probing devices are expensive while the principle of mechanics is simple. Due to the above limitations. This high temperature probe can give us the ability to study the resistivity of GST thin film in-situ.

### **Reading Street Lit with Incarcerated Juveniles: The Myth of Reformatory Incarceration**

College of Arts and Sciences: English

Oral Presentation - Graduate Research

**PRESENTERS** Jacob Scot Hale

**ADVISORS** David J Fine, Patrick W Thomas

**LOCATION, TIME** Humanities 110, 1:20-1:40

Street Literature—a popular, often young adult, genre that seeks to depict the socioeconomic realities of urban communities—has received much attention from educators and scholars of young-adult literacy. Some, such as Stephanie Guerra, advocate for its use with incarcerated youth because of its ability to resonate with their experiences of urban environments. However, the genre remains surprisingly understudied in the fields of literary and cultural studies. In my paper, I argue that Street Literature reinforces false or misleading narratives of the reformatory power of incarceration. Further, these books obscure realities such as the mass incarceration of people of color and the Prison Industrial Complex and suggest that escape from cycles of poverty and recidivism is possible with the help of determination or interpersonal relationships. To evaluate the effect of the problematic narratives on incarcerated juveniles, this paper uses an interdisciplinary approach by combining traditional literary analysis of several Street Lit works with qualitative field research. By conducting a focus group with residents at a juvenile detention center, I seek to understand if Street Lit can affect the residents' acceptance of the proposed reformatory power of incarceration inherent in many works of Street Lit. If those who study adolescent literacy advocate for the reading of Street Lit, then it's important to understand the genre's impact on vulnerable populations. Further, the better literary and cultural researchers understand the prison paradigms represented in popular literature, the better we can work to legitimize other, more constructive narratives which can counteract the existing structures of power. With this paper, I add to the conversation about how literature can contribute to issues regarding the intersection of literature and social justice.

### **Flyer Enterprises**

School of Business Administration: Crotty Center for Entrepreneurial Leadership

Oral Presentation - Independent Research

**PRESENTERS** Jon David Allen, Ryan James Barnes, Daniel Robert Bott, Melanie Rose Duffy, Michael A Haney, Ayrton Stanley Kazee, Anna Kathleen Pierce, Kyle Joseph Ransom, Abby Rose Schatzman, Jack Patrick Talaga

**ADVISORS** Janet R Leonard, Vincent C Lewis

**LOCATION, TIME** Miriam Hall 209, 1:20-1:40

Flyer Enterprises is the fourth largest student run business in the nation. The current executive team will present our business model and their passion and purpose for FE and the Dayton community.

### **What Happened to Active Participation?**

College of Arts and Sciences: Religious Studies

Oral Presentation - Capstone Project

**PRESENTERS** Martin Palmasani

**ADVISORS** William H Johnston**LOCATION, TIME** Humanities 122, 1:30-1:50

In the First half of this presentation, I will paint the background image of the Church's liturgy before Vatican II. In those days the people were physically present but as simple spectators, not active participants. The pre-conciliar efforts to improve this led to the creation of the council's liturgy document which highlighted liturgical reform having active participation as its main goal. I will show how this led to key changes, like Mass in the Vernacular for example. In the second half of this presentation I hope to make an argument for the need of another revitalization for active participation. Using the study titled Going, Going, Gone that shows reasons why people have left the Catholic faith, I will show that there is a decline in faithful participants in the coming generation that may continue to decline for years to come. One of the major reasons to this is the lack of education about the faith. This lack of education creates a chain reaction of those people not understanding the mass, thus not opening themselves to God, thus resulting in the abandonment of the faith. The graces of the liturgy are present, but the congregation is not actively participating. Many examples in Going, Going, Gone involved men and women leaving for reasons of "no longer being forced to attend", "Not believing in everything the Church says", or finding Church practices and doctrines to be "ridiculous" to name a few examples. These issues are changing the way the faith is understood and many of them are brought out of misinterpretation that can easily be rectified with greater education.

## **The Special Olympics and Globalization**

School of Education and Health Sciences: Health and Sport Science

Oral Presentation - Course Project, 201810 HSS 354 H1

**PRESENTERS** Eric R Schutter**ADVISORS** Haozhou Pu, Peter J Titlebaum**LOCATION, TIME** Kennedy Union 207, 1:30-1:50

This presentation talks about the history of the Special Olympics and discusses who started the event, where it originated, and what was the motivation behind its foundation. From there, it moves into looking at what advancements the Special Olympics made in order to appear on a global stage and their relationship with the International Olympic Committee, or IOC. This will show how the Special Olympics' involvement with the IOC leads to international growth as they are, most likely, the biggest reason the Special Olympics is able to grow on a global scale. Next, the presentation will discuss how the Special Olympics interacts with local governments. Much like the Olympics, the Special Olympics requires facilities where their athletes can perform. Do these countries build new facilities or use preexisting ones? Also, why do these nations choose to host the Special Olympics? Do they do it for the money, the association of helping those with disabilities, or something else entirely? Finally, the presentation will discuss how the Special Olympics interacts with its sponsors and stakeholders. It will look at how the Special Olympics came to partner with their sponsors and how they helped the organization reach a global audience. It will also discuss why some of these sponsors chose to partner with the Special Olympics, whether it be for public image or something else entirely. The presentation will conclude by discussing the Special Olympics' relationship with the media, how they are portrayed, and how they connect with the fans and consumers.

## **The Entropic Tsallis Q Factor as a Measure of Distance from Thermal Equilibrium in Paramagnetic Spin Lattices**

College of Arts and Sciences: Chemistry

Oral Presentation - Honors Thesis

**PRESENTERS** Charles Alan Benton**ADVISORS** Mark B Masthay**LOCATION, TIME** Kennedy Union 211, 1:30-1:50

The principle objective of the proposed research is to use the Tsallis entropy factor  $q$  to specify the proximity of a system to thermal equilibrium. More specifically, we will look at how different combinations of energy states affect  $q$  in two-level paramagnetic spin lattices (PSLs; regular lattices with spinsites) that are placed in an external magnetic fields. The spins in spin- $1/2$  PSLs align either parallel (the low energy level) or antiparallel (the high energy level) to the external magnetic field, thus making them two-level systems. The overall system under investigation is a collective super-PSL (A+B) comprised of two sub-PSLs (A and B). Two conditions are explored: (1) the canonical case in which a super-PSL at constant temperature exchanges energy with a heat bath; and (2) the microcanonical case in which the super-PSL is energetically isolated, and hence at constant energy.

## **Wives' Perceptions of Husbands' Housework and Parenting Contributions**

College of Arts and Sciences: Psychology

Oral Presentation - Honors Thesis

**PRESENTERS** Reilly Kate Kincaid**ADVISORS** Catherine Lutz Zois**LOCATION, TIME** Kennedy Union 312, 1:30-1:50

Compared to the nuclear family in previous decades, today's typical family is less likely to have only the father working for pay and the mother possessing sole responsibility for the housework and childcare. As women continue to strive toward more equal participation in the paid workforce, many studies have pointed to trends of dual-income families' redistribution of household labor



between spouses. Although husbands may be increasing their housework and childcare contributions, the type of contributions they make tend to be that of a “helpmate,” leaving the responsibility for the organization and management of such labor to their wives. Using a qualitative method, Gordon and Whelan-Berry (2005) found that the majority of husbands spent more time “doing” rather than “managing” in the household. The present study uses a sample of female faculty and staff at the University of Dayton, who are in dual-income marriages and have children, to examine wives’ perceptions of how much their husbands “do” and how much their husbands “manage” in terms of housework and childcare. Participants completed questionnaires to measure their perceptions of how frequently their husbands “do” and “manage” various household and childcare tasks, their initial expectations regarding their husbands’ contributions, and their satisfaction with life and marriage. Results provide quantitative support for Gordon and Whelan-Berry’s high-doing, low-managing husband norm and shed light on the different implications that husbands’ various contributions have for wives’ life and marital satisfaction. Husbands’ ‘doing’ behavior emerges above their ‘managing’ behavior in terms of its importance in predicting satisfaction, suggesting that the “helpmate husband” arrangement is not only tolerated, but perhaps even preferred among some women. The variety of factors perpetuating this trend, and the doing-managing dichotomy more generally, remain unclear and constitute an important area for gender and family research to focus on in future studies.

## When Feminism Meets Hip-hop

College of Arts and Sciences: English

Oral Presentation - Honors Thesis

**PRESENTERS** Kylie Anne Thompson

**ADVISORS** Thomas L Morgan

**LOCATION, TIME** Humanities 118, 1:30-1:50

My Honors Thesis focuses on hip-hop as a socio-political genre and as a means of advocacy via its ability to mobilize listeners toward social change. While the genre’s deeply political critiques traditionally focus on matters of race and class, some female hip-hop artists challenge the sexist culture of the industry and assert a feminist voice. My research specifically engages with the ways this feminism functions in conjunction with the manipulation of gendered language, revealing how feminist strategies confront systemic sexism. Further, certain issues closely connected to the field of feminism spark controversy among feminists over what constitutes challenging the patriarchal system. In this paper, I draw on feminist thinkers as well as hip-hop scholars in order to posit a radical feminist interpretation of contemporary female hip-hop artists, and I provide a critical analysis of their lyrics in support.

## King Arthur as Transcendent Rhetoric of Anxiety: Arthurian Legends as Sociopolitical Paratexts

College of Arts and Sciences: English

Oral Presentation - Capstone Project

**PRESENTERS** Alexis Faith Ancona

**ADVISORS** Miriamne A Krummel, Elizabeth A Mackay, Bobbi Sue Sutherland

**LOCATION, TIME** Marianist Hall Learning Space 218, 1:30-1:50

As a recurring figure representative of the institution of kingship, King Arthur presents a unique rhetorical opportunity to examine sociopolitical anxieties of the Middle Ages. Because of his unique position, I propose Arthur himself is a text to be analyzed. With Arthur established as a text, specifically one of rhetorical significance, I analyze his subsequent iterations (historical and literary) as paratexts. Traditionally, paratextual analysis has involved an investigation of the literal and physical artifacts surrounding a text; however, by examining Arthur the figure as a text, I apply paratextual analysis theoretically. Rather than examining book bindings or author’s notes, I argue Arthur’s paratexts involved genre/iteration and the sociopolitical rhetoric of his authors. Through this method, I argue that Arthur is a transcendent text onto which sociopolitical anxieties are imposed, making him more than a literary figure but rather a rhetorical device of cultural memory and anxiety. Reading Arthur as such provides not only significant opportunities to recover marginalized narratives of medieval England, but also considering his continuing iterations, insight into present sociopolitical anxieties.

## MIS Senior Capstone Project Wright “B” Flyer Quickbooks & Point of Sale Implementation

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** Laylah Victoria Funk, Stephen Key Harvey, Lydia Noel O’Connell, Benjamin Joseph Warpinski

**ADVISORS** Stephen Russell Hall

**LOCATION, TIME** Miriam Hall 207, 1:30-2:00

MIS Capstone Wright “B” Flyer Project Description The University of Dayton MIS Capstone Team, consisting of Laylah Funk, Stephen Harvey, Lydia O’Connell, and Benjamin Warpinski, will be working with Jay Jabour from Wright “B” Flyer Inc. to consult on a variety of areas, as described below: Aid in the migration of Quickbooks into the main Wright “B” Flyer Inc. office location? Build processes to extract relevant financial data from Quickbooks, in order to calculate a variety of metrics as defined by Wright “B” Flyer Inc.? Perform limited analysis for the past 3 years of Wright “B” Flyer, Inc. financial data to inform the process recommended for future extraction of relevant data from Quickbooks going forward The University of Dayton MIS Capstone Team proposes to present 3 deliverables to Wright “B” Flyer Inc. throughout the Fall 2017 semester (September 2017 - December 2017). The 3 deliverables are as follows: a Baseline Project Plan, a Requirements Document, and a Design Document. Dates for these presentations will be set up

as the semester progresses.

### **Political Science Senior Capstone: Battleground States and Presidential Elections**

College of Arts and Sciences: Political Science

Oral Presentation - Course Project, 201810 POL 499 01

**PRESENTERS** Brian P Callahan, Hayley Jean Clark, Nicholas Scott Hagenkord, Chase Sterling Hite, James Russell Lee, Matthew Madden, Laura Elizabeth Martine, Nancy A Miller, Haley Erin Naughton, Will Joseph O'Shea, Leo James Schenk, Claire Elizabeth Schmig, Sydney Skidmore

**ADVISORS** Daniel R Birdsong, Christopher J Devine, Nancy A Miller

**LOCATION, TIME** Kennedy Union 311, 1:30-3:00

Students in POL 499 assisted Dr. Daniel Birdsong and Dr. Christopher Devine with their research on presidential campaign battleground states. As part of the political science capstone requirements, the students, in groups, identified their own research question about battleground states and presidential campaigns. They collected relevant data and analyzed that data to address their questions. The results are presented in this session.

### **Directional Emission of Light in Hyperbolic Metamaterials through Spin-Orbit Interaction**

School of Engineering: Electro-Optics and Photonics

Oral Presentation - Graduate Research

**PRESENTERS** Hongwei Chen

**ADVISORS** Qiwen Zhan

**LOCATION, TIME** Fitz Hall 580, 1:40-2:00

Metamaterials are artificial media engineered to have the unusual electromagnetic (EM) properties that are not found in nature. We demonstrate a dipole with circular polarization located in an isotropic material, right against a metamaterial with a hyperbolic dispersion relation in two dimensions, the EM waves will be guided into two different directions dependent on the polarizations of the incident illumination. It is crucial to control the photonic emission by single emitters in nanophotonic systems for quantum information processing. The presented work of spin controlled directional emission introduces a new route to steer the direction of the EM waves, which also provides a great opportunity for compact polarization-tunable unidirectional manipulation of EM waves and nano-particles. Other applications may exist in arbitrary polarization detection.

### **Taking College Students on the Silent Journey: Reclaiming Silence in a Culture of Noise**

College of Arts and Sciences: Religious Studies

Oral Presentation - Course Project, 201810 UDI 163 01

**PRESENTERS** Joe James Oliveri

**ADVISORS** James Schimelpfening, Sandra A Yocum

**LOCATION, TIME** Kennedy Union 310, 1:40-2:00

We live in a culture of noise, a world of busyness. On a college campus, it is even harder to find time for silence, for prayer, for simply - being. As I minister to students in their daily lives of classes, extra-curricular activities, social media, music, relationships, it seems especially hard for them (much like myself) to reserve time for silence and recognize God's presence always and everywhere. In my mini-course, I took eight students on "The Silent Journey" in hopes to not just find more silence but to silence (discipline) their words, actions, thoughts, feelings, and imagination through Marianist spirituality and Catholic Christian contemplative traditions. Students met for two hours once a week to pray, listen to one another, and learn more about ways to practice silence amidst the noise in their lives. The hope was that these students would see that silence is not only the absence of something but the presence and way of life of something greater. It is my belief that only then will prayer impact our faith and lives deeply so we can make a positive change in this noisy, busy world we all share as one.

### **Flyer Angels: A Student Run Angel Investment Fund**

School of Business Administration: Management and Marketing

Panel Discussion - Independent Research

**PRESENTERS** Brandon Robert Braun, Maddie Walker Collins, Amy Elizabeth Nolan, Todd Richard Price, Jen Marie Rondinelli, Jack Patrick Talaga

**ADVISORS** Jay J Janney

**LOCATION, TIME** Miriam Hall 209, 1:40-2:20

Flyer Angels at the University of Dayton is one of 5-10 programs in the United States where undergraduate students make investments in technology-based startup companies. Students manage a 7 figure portfolio, with investments in four angel funds and 8 portfolio companies. Students analyze companies, conduct a due diligence analysis, and vote on providing funding to technology-based start-up companies. Currently students have invested \$50k in Ohio Tech Angels Fund V, which raised \$6 million. As members of fund V, students 4 times this year have joined an investment team of 8-10 individuals, who develop an investment proposal to all Fund V members. Typically they approve providing \$250k investments from the fund, and students can invest an additional \$10k-\$25k in any investment deal they think merits an additional investment. Each year Flyer Angels selects 6 junior and senior

entrepreneurship majors to form the following year's team. It's a paid position. Teams meet each week to discuss the current portfolio, conduct due diligence on investments they seek to make, and develop a funding proposal for deals they seek to make. In this session we'll ask this year's members to discuss their experiences, what they like and what surprises they have found. The audience is encouraged to ask questions as well.

### With Him

College of Arts and Sciences: Art and Design  
Porch Project - Independent Research

**PRESENTERS** Jesse James Thompson

**ADVISORS** Jeffrey C Jones

**LOCATION, TIME** 514 Lowes Street, 1:45-2:00

For the Stander Undergraduate Fellowship I will be showing an exhibition at 514 Lowes that entails a variety of media. With multi-media pieces, purely photographic pieces, some alternative, and some painting I am showing a series of works that represent my understanding of sexuality and growth in relationships. The pieces speak to social platforms and sexuality behavior beyond heteronormative culture.

### Considering the student perspective: An autoethnography of a graduate grant-writing internship at a local nonprofit organization

College of Arts and Sciences: English  
Oral Presentation - Capstone Project

**PRESENTERS** Katherine Jenness DeVantier

**ADVISORS** Nicky F Adams, Jennifer E Haan, Patrick W Thomas

**LOCATION, TIME** Humanities 110, 1:50-2:10

This project is an autoethnographic case study exploring the experiences of a graduate student completing a grant-writing internship with a nonprofit organization in Dayton, Ohio. Whereas previous scholarship has supported its findings with student experiences conveyed through the secondary lens of an academic professional, this project seeks to examine a professional writing internship from the student's perspective. It finds that while many of the author's experiences paralleled those outlined by other interns in established research, her internship experience overall was marked by a more consistent and lingering sense of concern not assuaged by the end of the internship. This occurrence affected the holistic view of the internship and the work she was doing. Given these results, this project outlines implications for three involved parties: the student interns, the academic institutions from which the students come, and the industry mentors as representatives of the sites at which internships take place. For students, it is important to select internship writing tasks that build from already-established content knowledge; students must also be vocal about their efforts during the internship and seek out help when necessary. For academic institutions and industry mentors, it is crucial to maintain open lines of communication and establish consistent feedback opportunities, often in more formal class settings in regards to the former. As internships continue to play a large role in preparing students for work after graduation, it is crucial that students, schools, and organizations continue to communicate about expectations and consult the primary individual undergoing the most development and growth: the student intern.

### The Riemann Hypothesis

College of Arts and Sciences: Mathematics  
Oral Presentation - Course Project, 201810 MTH 404 H1

**PRESENTERS** Amelia Isabella Pompilio

**ADVISORS** Andres Larrain-Hubach

**LOCATION, TIME** Kennedy Union 207, 2:00-2:20

Bernhard Riemann only wrote one number theoretic paper in his career as a mathematician. However, within this single paper is one of the most important topics in number theory: the Riemann Hypothesis. The Riemann Hypothesis remains a hypothesis, not a theorem, to this day. The statement of the hypothesis is important to the distribution of prime numbers. Mathematicians so far have good estimates for locating prime numbers within the number line, but they are still only estimates. The Riemann Hypothesis would provide the clearest picture of how the prime numbers behave, if it could be proven true. If the Riemann Hypothesis were proven, the implications of its truth would reach much further than just the prime numbers. Many other areas of mathematics and physics depend on the unproven Riemann Hypothesis in some way. This talk will outline the statement of the Riemann Hypothesis and why it matters.

### A Fine-Grained Permission Model for Web-Based Mobile Applications

College of Arts and Sciences: Computer Science  
Oral Presentation - Independent Research

**PRESENTERS** Steven Edward Cap, Anthony Pierce

**ADVISORS** Phu Huu Phung

**LOCATION, TIME** Kennedy Union 211, 2:00-2:20

As smartphone technology progresses mobile applications (apps) developers are turning toward hybrid applications which are web language based on using web technologies due to the portability. With the rise of hybrid apps, many frameworks have been developed to make the process of creating these types of apps easier. This makes securing apps more difficult because there are more vulnerabilities in a web-based system versus using a standard native app. To combat these issues we propose a novel fine-grained permission model for hybrid apps that the users can control the behaviors of the apps. In this new model, the users can set a wide range of policies on resource accesses based on location, time period, times of accessing and so on, compared with “all-or-nothing” conventional permission model. We implemented this model by adopting a system called HybridGuard [Phung, et. al., MoST2017]. As our permission model is developed using the web technologies, it can be deployed on different mobile platforms. We evaluate our implementation on the Cordova framework, one of the most common frameworks used by hybrid app developers. We test the policies and their enforcement on various plug-ins, programming libraries to access the phone resources such as location, camera, and so on, from this framework and several related frameworks on Android and iOS mobile platforms.

## **Growth Regulatory Pathway collaborates with Axial Patterning Genes to regulate Patterning and Growth in Drosophila Eye**

College of Arts and Sciences: Biology

Oral Presentation - Graduate Research

**PRESENTERS** Neha Gogia

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** Kennedy Union 312, 2:00-2:20

In all the multicellular organisms, organogenesis requires axial patterning to determine Antero-Posterior (AP), Dorso-Ventral (DV), Proximo-Distal (PD) axes. Any deviation in these axes during development leads to congenital birth defects. In our model system, *Drosophila melanogaster* (a.k.a fruit fly), Dorso-Ventral (DV) patterning marks first lineage restriction event. We have identified defective proventriculus (*dve*), an ortholog of SATB homeobox 1 (special AT-rich sequence binding protein 1), as a new member of DV patterning genes hierarchy. We have shown that *dve* acts downstream of *pannier* (*pnr*, a GATA-1 transcription factor), and upstream of *wingless* (*wg*) in dorsal gene hierarchy. Loss-of-function (LOF) of *dve* or *pnr* results in dramatic dorsal eye enlargements, whereas Gain-of-function (GOF) of *dve*, *pnr* suppresses eye specific fate. We have demonstrated that *Wingless* (*Wg*), (1) is downstream target of Hippo growth regulatory pathway (highly conserved) in eye, (2) acts downstream of *dve*, (3) exhibits similar eye enlargement and suppression phenotypes (upon LOF, GOF respectively), and has been shown to play a role in growth. Here, we present that, DV patterning genes interacts with Hippo signaling to regulate their common downstream target, *Wg* during developing *Drosophila* eye. Our data (using GOF, LOF) states that (1) These two unrelated pathways are related and interacts antagonistically, (2) Activating Hippo signaling suppresses *dve*, *pnr* expressing cells, downregulates *Wg* and changes head, antennae specific fate to an eye, (3) Blocking cell death activity of *hpo* (using UAS-*p35*, anti-apoptotic) doesn't affect its ability to undergo differentiation, (4) Growth regulatory pathway regulates the expression of DV patterning genes (*dve*, *pnr* acts downstream of Hippo pathway), and that (5) GOF/LOF of *dve*, *pnr* does not affect the expression of Hippo downstream reporters *diap1* and expanded in developing eye of *Drosophila*. These studies present new genetic interaction between two unrelated pathways to regulate growth and patterning of an organ.

## **Murky Water, Fluid, and the Borderlands of Language: An Exploration of Toni Morrison's Beloved**

College of Arts and Sciences: English

Oral Presentation - Honors Thesis

**PRESENTERS** Julia Kristin Hall

**ADVISORS** Rebecca C Potter

**LOCATION, TIME** Humanities 118, 2:00-2:20

Centered on Toni Morrison's *Beloved* and her process of writing the novel, this thesis links the crossing of a river, the birthing of a child, and the creation of a text. By drawing upon theories of composition, feminism, and genre theory, the exploration of *Beloved* balances discussion of writing process, language, and textual analysis. Buttressed by a complimentary text, Gloria Anzaldúa's *Borderlands/La Frontera: The New Mestiza*, the connection between creation of language, identity, and body is underscored in Morrison's own process. Since this thesis analyzes *Beloved* from multiple theoretical perspectives, it is the correlations between the composition and literary approaches that provide the substance. Amongst the findings of such analysis include: the weird both in the simultaneous creation of individual and collective identity, the looping of the birthing process, the creative and destructive power of birthing, and the regulation of bodies—ideas that will be elaborated upon in the presentation.

## **Investigating the role of a novel calcium-handling protein in regulating locomotor and cognitive behavioral processes in mice**

College of Arts and Sciences: Biology

Oral Presentation - Independent Research

**PRESENTERS** Aikaterini Britzolaki, Emily Margaret Flaherty, Joey Edward Saurine, Connor F Thelen

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** Marianist Hall Learning Space 218, 2:00-2:20

Attention-deficit/hyperactivity disorder (ADHD) is an extremely prevalent and debilitating neurodevelopmental disorder that affects people of all ages. ADHD symptoms include persistent inattention, impulsivity and/or hyperactivity, accompanied by significant learning and memory deficits. Abnormal function of calcium-handling machinery has been implicated in the pathophysiology of ADHD in humans and in animal models. Exciting preliminary data from our group support that a protein which plays a major role in regulation of calcium homeostasis in the heart, is also expressed in a specific region of the brain that is implicated in the neurobiology of ADHD. Moreover, we have found that genetic ablation of this calcium-handling protein in mice (i.e., knockout, KO) results in the manifestation of a hyperactive ADHD-relevant behavioral phenotype. State-of-the-art mouse behavioral neuroscience techniques were performed to further dissect the hyperactive locomotor phenotype of KO mice, and to assess how loss of the calcium-handling protein's function impacts critical cognitive processes (i.e., object recognition memory, spatial memory and social memory). The results of the proposed studies have shed light on the complex functions of this novel calcium-handling player in the brain suggesting this calcium-handling protein is involved in locomotor and learning and memory processes of the brain.

### **Promotion of Human Rights – Women, Education, and Persons with Disabilities**

College of Arts and Sciences: Political Science

Panel Discussion - Course Project, 201810 POL 336 01

**PRESENTERS** Darius Jamal Beckham, Thomas Cyrus Goffas, Charlie Michael Homan, Sabrina Assunta Rita Jemail, Carlos Martin Rodriguez, Erin Mary Winchester

**ADVISORS** Susan M Weaver

**LOCATION, TIME** Marianist Hall Learning Space 217, 2:00-3:00

This panel will address the role of the United Nations in promoting human rights, with focus on the rights of women, the right to education, and the rights of persons with disabilities, through the discussion of six case studies.

### **The Internet Made Me Do It: How the Internet Effects the Image of Presidential Candidates**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Colleen Anne Dwyer

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

The internet is a unique and relatively new source for spreading news. It can instantaneously share information worldwide with a click of a button and can usually be accessed for free. More traditional news platforms like television and print are still big competitors in the news industry but operate differently. A presidential election in the United States is one of the most crucial times for news coverage and a time when many Americans prioritize learning about candidates. This project aims to determine whether someone who gets their presidential campaign news solely from the internet will view a candidate as more or less knowledgeable compared to someone who got none of their news information from the internet. To examine this topic, I use the Supplementary Empirical Teaching Units in Political Science (SETUPS) data from the American National Election (ANES) 2016 Time Series Study, which were retrieved from the Inter-university Consortium for Political and Social. The analysis of the data will control for sex, age, race, region where respondent grew up and if they voted in the 2016 election. This research uncovers the variation in perceptions of presidential candidates between those who do and do not use the internet for news.

### **Is preschool helping students?: The relationship between preschool enrollment rates and third grade test scores.**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Pamela Dawn Venard

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

Pre-school is becoming more commonly used to help children start their academic careers. However, research is mixed on how well preschool impacts student achievement. In this study, I use data from the Ohio Department of Education and the U.S. Census to examine third grades test scores for each school district in Ohio from the 2016/17 school year and their relationship to preschool enrollment rates in 2012/13 school year. I will be controlling for population and percent poverty. Findings from this research will present the relationship between preschool enrollment and the third grade test scores and whether that relationship varies across school district level poverty.

### **Early Childhood Education: an Analysis of the Correlation in Daily Reading Habits and Family Income**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Carrie Anne Matthews

**ADVISORS** Leslie H Picca, Danielle C Rhubarb

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

Children's educational development is associated with early childhood experiences, such as being read to on a regular basis. However, such experiences may be influenced by factors related to family income level. This research examines the relationship between a family's poverty level and whether or not a child is read to everyday. To address this research topic, data from The Massachusetts Early Care Education and School Readiness Study are used, which contain variables related to family poverty status and how many days per week the child was read to in the home. Findings will provide an initial understanding of how daily reading habits vary across family poverty status.

## **Does education explain perceptions of immigrants? A closer look at the General Social Survey**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Emily Patricia McAleese

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

The United States is one of the top destinations for immigrants with over 44 million currently living in the U.S. The overall perceptions of immigrants varies greatly across the country. This study provides an in-depth analysis of whether Americans think immigrants are good for the overall country and whether education attainment relates helps explain variation in perceptions. The data for this study is from the General Social Survey, which is a nationally representative sample of adults in the U.S. The results of this study help uncover the characteristics that could influence one's view on immigrants. With debates around immigration reform are receiving national attention, understanding how perceptions of immigrants vary by socioeconomic factors may be helpful to policy makers.

## **What can poverty affect? The effects that poverty has on education**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Oral Presentation - Capstone Project

**PRESENTERS** Sidney Alexandra Leroy

**ADVISORS** Leslie H Picca, Danielle C Rhubart

**LOCATION, TIME** Kennedy Union 222, 2:00-3:00

Previous research has shown that poverty has a negative effect on student success in school. I am performing quantitative analysis on existing data sets to learn how poverty affects student dropout rates. I will be using data from the American Community Survey 2012-2016, collected by the United States Census Bureau. My research will present the relationship between dropout rates and poverty rates across school districts in the state of Texas.

## **Building Historical Literacies in Secondary School Students (2 of 2)**

School of Education and Health Sciences: Teacher Education

Panel Discussion - Course Project, 201810 EDT 323 01

**PRESENTERS** Macey Nicole Berkley, Kelly Michelle Conkel, Allie Lana Kenne, Marcus Anthony Lajeunesse, Laura Marie Nobel, Hannah Margaret Peterson, Dylan H Schirmer

**ADVISORS** John J White

**LOCATION, TIME** Kennedy Union Torch Lounge, 2:00-3:00

Our panel presentation will demonstrate strategies to increase historical literacy in a secondary school history classroom. We will illustrate the difference between historical knowledge and historical literacy by presenting our research on methods of teaching designed to increase historical thinking skills. Several practices that teachers should employ to teach students how to analyze historical texts using historical literacy methods will be discussed, including sourcing, close reading, corroboration, and contextualization. Having read deeply into the historiography of the Irish Famine, and after examining the famine curricula in New York and New Jersey, we will discuss how sources such as memoirs, folklore, newspaper, and government documents provide valuable insight into the heuristics that historians use when constructing a historical narrative. High school students should begin to understand and develop these heuristics after a thorough examination of the primary and secondary sources used throughout school texts and curricula facilitated by critical discussion and guidance from the teacher; we will specifically target the epistemic stance and cognitive meta-concepts used by historians.

## **Autonomous Sumo Bot Tournament**

School of Engineering: Mechanical and Aerospace Engineering

Interactive Competition - Course Project, 201810 MEE 298 02

**PRESENTERS** Matthew Thomas Adkins, Bander Saleh Al Yami, Abdullah A Alharbi, Mansour Kh M A H A Almutawa, Austin Lawrence Andwan, Nathan Robert Berner, Adam J Berry, Ben Daniel Berry, Garrett Nichols Bolton, Nathan Thomas Borries, Merrideth Rose Braucher, Jeff Alan Brown, Liam Cregg Budnik, Hamad N M R Bumaryoum, Jimmy Joseph Butch, Jack William Cleave, Austin Patrick Clemens, Ali Ann Danielson, Sam Powell Dasco, Jared Walter Dejonckheere, David Charles Di Staulo, John Michael Dougherty,

Alexander Nicholas Duda, Caroline Joan Ellis, Leah S Henkel, Beth Kate Hoffman, Elizabeth I Horner, Kaitlyn Nicole Hoying, Pearson Lee Ihmels, Camden Lee Ives, Matthew Patrick Jensen, Jimmy Michael John, Zach Thomas Johnson, Zack James Jordan, Justin Louis Kareem, Hannah Ruth Kelly, Michael Patrick Kerner, Scot Philip Kingan, Matthew Quin Klein, Michael Robert Komanetsky, John Carl Kunzmann, Ashley Marie Kush, Michael Henry Lander, Mark W Lauterbach, Kevin Robert Lawson, Kathleen G Lehman, Sydney Marie Lundell, Mary Grace Malon, Samuel Charles Marek, Kyle J McGibbeny, Eva Rose McLaughlin, Will Robert Medved, Maria Elizabeth Mescher, Michael Mongin, Jeremy Preston Neff, Amy T Neidhard-Doll, Jacob T Nguyen, Michael H Niese, Grant Henry Noll, Meredith Kathleen Nortz, Justin T O'Neill, Alex Thomas Otto, Liz P Overbeek, Ethan Park Owens, Josh M Panczyk, Nicholas Alexander Pannunzio, Connor Ryan Paxton, Anthony Dominic Petrilli, Mickey Thinh Pham, Sean Michael Prophit, Timothy Reissman, Kyle Rudolph, Patrick Neil Ruhala, Kristen Mae Sanson, Joe Edward Schlangen, Thomas Joseph Schlitt, Zachary Robert Schumm, Katherine Grace Sexton, Daniel Jay Sisler, Luke Tomokatsu Stromberg, Adam C Suddarth, Rachael Marie Supina, Colin Robert Theis, Annie Patricia Trotta, Joseph Patrick Vicario, Liam Patrick Walsh, Joe Reed Weeks, Jack Robert Wernet, Colt Anderson Whitman, Cassie Leigh Woodward, Spencer Ashton Wyatt, David William Yackzan, Drake Thomas Yinger, Michael Jeffrey Zawlocki

**ADVISORS** Amy T Neidhard-Doll, Timothy Reissman

**LOCATION, TIME** Science Center Atrium, 2:00-5:00

The Sumo Bot IV Tournament is back at Stander and keeps getting bigger! This year we estimate 44 robots will be competing in a battle royal to see who is the top Sumo Bot. The format is the following: Two robots compete in a head-to-head match following the basic system of traditional human sumo matches. The sole purpose is a pushing match between the two robots to force the other from the Dohyo (Sumo arena). The best-of-3 matches winner moves on to the next round to face their next opponent and the process continues until our new champion is crowned. Some cool notables about the students: Many of the students are engineering sophomores and in their first class for electronics. Not only are they learning how to mechanically and electrically design their sumo robot, but they are also learning how to program their robots to be autonomous while in the Dohyo... meaning no remote controls! So while self-driving cars maybe a thing of the future, self-sumo robots are already here at Dayton! Come cheer on the students and their robots as we showcase their creations.

## #Aware

College of Arts and Sciences: Art and Design

Porch Project - Independent Research

**PRESENTERS** Hadley Caitlin Rodebeck

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** 461 Keifaber Street, 2:15-2:30

#Aware is a presentation created ed to address today's contradicting views of feminism and demonstrate how blaming 'the patriarchy' is not the answer. A video/installation will be shown followed by discussion concerning the critique of what is lacking in the discussion of female empowerment such as personal responsibility, self-defense, that it is not a gender-specific issue, and how to heal from a traumatic situation is as important as how to prevent a trauma-based situation.

## Probing Metal-Induced-Gap-State Electrons and Photon-Assisted-Tunneling Electrons at Metal-Insulator Interfaces by Harmonic Generation

School of Engineering: Electro-Optics and Photonics

Oral Presentation - Graduate Research

**PRESENTERS** Raihan Hussain

**ADVISORS** Imad Agha, Joseph W Haus

**LOCATION, TIME** Fitz Hall 580, 2:10-2:30

The ubiquitous presence of metal-insulator (MI) and metal-insulator-metal (MIM) interfaces in electronic and optical devices make them technologically very important and necessitate an understanding of their fundamental properties. We experimented on Insulator/Au and Au/Insulator/Au interfaces. First, the insulator ( $Al_2O_3$  or ZnO) layer was deposited on planar Au samples using atomic layer deposition (ALD) technique to form MI interface. Later, Au nanoparticles (AuNP) of diameter 10nm were immobilized on the insulator layer to prepare MIM interface. SHG and THG from both of these interfaces were used for our analysis. The goal of our experiment is twofold: a) Measuring delocalized electron density at MIGS using SHG, b) Measuring field enhancement due to PAT theory using the changes in THG as well as no-change in SHG efficiencies.

## MIS Senior Capstone Project UDIT - Enhance Printing Services

School of Business Administration: MIS, OM and Decision Sciences

Oral Presentation - Capstone Project

**PRESENTERS** William Edward Doorack, Alex Joseph Formosa, Samuel Robert Parks, Michaela Jean Patsko, Jie Wang

**ADVISORS** Stephen Russell Hall, Merete Hvalshagen

**LOCATION, TIME** Miriam Hall 207, 2:20-3:00

UDIT approached our group in hopes of finding a solution to a few issues they were experiencing with the current print system on campus. Their overall goal at the culmination of the project is to develop a system to make printing services at the University of Dayton more efficient, cost-friendly and sustainable while at the same time streamlining the process into one cohesive workflow.

While this is the main backdoor objective, UDIT has also asked we boost marketing for this new system to increase awareness of the managed print system and to ensure that faculty and students feel more comfortable using it. The issue UDIT is facing centers around its managed print system, which has multiple different components. The first deals with the way people print on campus. There are currently two options, the managed print program which the university pays a service for, and the HP printers located in each faculty department. Our goal here is to find how cost effective it would be to eradicate all of the older HP printers and rely solely on the managed print service. Another issue they are facing, which is not as pressing as the first, centers around the contract UDIT currently has with Pro-Source will expire sometime in the middle of next year. Our goal here is to make sure that this company is providing the most cost effective service and no other competitors in the industry can offer any better. Our final task assigned to us by UDIT was to clean up current database of department codes within each of managed print printers to ensure each printer is specifically dedicated to a certain area on campus or department. Currently there are a myriad of codes on various different printers around campus that have not been cleaned up in the past 5-10 years. Cleaning up the codes will make the new system working process more easy to track, and create a database record every printing task. Rectifying all of these issues will achieve UDIT's goal of created a more streamlined, cost-effective, and energy efficient printing service at the University of Dayton.

### **Flyer Consulting: Past, Present, & Future**

School of Business Administration: Crotty Center for Entrepreneurial Leadership  
Oral Presentation - Independent Research

**PRESENTERS** Morgan Rose Eifert, Stephen Key Harvey, Eric William Mullet, Chloe Elizabeth Voelker

**ADVISORS** Vincent C Lewis

**LOCATION, TIME** Miriam Hall 214, 2:20-3:00

Flyer Consulting is one of the University of Dayton's fastest growing organizations that continues to evolve each semester. Our team takes the knowledge and skills gained in the classroom, as well as individual real-world internship/job experiences, and puts it to practical use for nonprofit organizations around the world. This Stander Symposium will serve as a unique opportunity for audience members to hear from the management team, project leaders, and younger members of the organization.

### **OPS 495 Capstone Project Presentations (Part 3 of 3)**

School of Business Administration: MIS, OM and Decision Sciences  
Oral Presentation - Capstone Project

**PRESENTERS** Luke Joseph Bick, Kailee Ann Budicin, Stacy Nicole Cruze, Jing Dang, Kristina Sara Depaola, Andrew Thomas Fenlon, Connor T Hemmelgarn, Wallace James Huggett, John J Kanet, Nick X Mangan, Dieter F Manke, Nathan Jacob Marotta, Hannah Eden Odzer

**ADVISORS** Michael F Gorman, John J Kanet, Robert A Kinion

**LOCATION, TIME** Miriam Hall 103, 2:20-3:20

Senior Operations and Supply Management majors present the results of their Capstone Projects.

### **ACC 602A - Information Assurance Presentations on Analytical Procedures (Part 2)**

School of Business Administration: Accounting  
Oral Presentation - Course Project, 201810 ACC 602A 01

**PRESENTERS** Alison M Berry, Tyler David Grile, Timothy James Hoffman, Elinor Louise Schuck

**ADVISORS** Marsha K Keune

**LOCATION, TIME** Miriam Hall 104, 2:20-3:20

Master of Professional Accountancy students present the results of a class project utilizing Tableau, a data visualization tool, to develop, evaluate, and communicate analytical procedures commonly performed by external auditors.

### **Understanding Place Branding**

College of Arts and Sciences: Art and Design  
Porch Project - Honors Thesis

**PRESENTERS** Lucy Elizabeth Bratton

**ADVISORS** Jayne Matlack Whitaker

**LOCATION, TIME** 432 Stonemill Road, 2:30-2:45

This Honors Thesis Project explores an emerging area of graphic design known as place branding. Place branding markets the physical, economic, social, and civic qualities of a place to enhance economic and community development. Successful city brands are derived from the histories, qualities, lifestyles, and cultures of their cities to proactively form partnerships between city municipalities, government, and citizens. When created and implemented successfully, place branding has the unique ability to unite and enhance the lives of citizens. By closely examining successful samples of recent place branding, this project presents the creation of a mark and guidelines for the place branding of the city of Dayton, Ohio. This creative research is presented in the design of a physical book.

### **Evidence in Online Political Discourse: How Everyday Citizens Argue about Politics on**



## Social Media

College of Arts and Sciences: English  
Oral Presentation - Honors Thesis

**PRESENTERS** Diane Joy Leverich

**ADVISORS** Patrick W Thomas

**LOCATION, TIME** Humanities 118, 2:30-2:50

This study is an examination of how everyday people use evidence to engage in political discussions on the social network Reddit.com. Evidence use is especially important in online political conversations because the reporting of political events and issues can vary depending on the source and is often subject to intense deliberation. This thesis explores use of evidence in a political subreddit to examine what patterns, if any, emerge from how individuals employ evidence in constructing arguments and counterarguments in public political forums. In doing so, I am to show how ordinary citizens (i.e., those lacking political power or influence) shape their own forms of political discourse online.

## Nondestructive Approach for Additive Nanomanufacturing of Metallic Nanostructures in the Air

College of Arts and Sciences: Physics  
Oral Presentation - Graduate Research

**PRESENTERS** Md Shah Alam

**ADVISORS** Chenglong Zhao

**LOCATION, TIME** Fitz Hall 580, 2:30-2:50

In this project, a mechanism for quick release and transfer of gold nanoparticles (GNPs) from a soft substrate to another substrate under laser illumination is investigated. The heating of GNPs on a soft substrate with a continuous-wave laser causes a rapid thermal expansion of the substrate, which can be used to selectively release and place GNPs onto another surface. In-plane and out-of-plane nanostructures are successfully fabricated using this method. This rapid release-and-place process can be used for additive nonmanufacturing of metallic nanostructures under ambient conditions, which paves a way for affordable nanomanufacturing and enables a wide variety of applications in nanophotonics, ultrasensitive sensing, and nonlinear plasmonics.

## Influence of Reverse Shoulder Implant Positioning on Patient-Specific Muscle Forces: A Simulation Study

School of Engineering: Mechanical and Aerospace Engineering  
Oral Presentation - Honors Thesis

**PRESENTERS** Kayla Pariser

**ADVISORS** Allison L Kinney

**LOCATION, TIME** Kennedy Union 207, 2:30-2:50

Currently there is not a standardized, objective method for a surgeon to position a reverse total shoulder arthroplasty (RTSA) in a specific patient. Simulation and optimization methods have been used to analyze how surgeries affect muscle function with generic models. However, the effect of patient-specific muscle parameters on modeling realistic muscle function in the RTSA population is unknown. Calibration of patient-specific parameters via optimization is feasible, but can be time consuming. Due to the fast workplace environment, surgeons cannot afford to wait for optimizations to converge. To decrease convergence time and apply these tools clinically, muscle parameter optimizations must be provided a realistic initial guess representative of the patient's muscle function. To our knowledge, previous studies have not established guidelines for adjusting muscle parameter values from literature sources to patient-specific values, but one possible mechanism is reduction of passive force. The purpose of this study was to investigate how much deviation from the literature muscle parameter values is necessary to reduce passive force and produce more realistic muscle activations for patient-specific cases. Patient-specific shoulder models were generated for eight subjects with two different implants. The literature muscle parameter values for the three deltoid muscles were modified via manually chosen scaling factors chosen to reduce passive muscle force and find common factors across all subjects for each deltoid. Following the parameter sensitivity study it was determined that reduction of passive force produced more realistic muscle forces and activations for all subjects. Common scaling factors were found across all of the subjects for two of the deltoids. There was inconsistency among the subjects as to which deltoid required the most parameter adjustment, emphasizing the importance of patient-specific muscle parameter adjustment. Once the parameters were adjusted, the muscle activation and force contribution became more realistic for all three deltoid muscles for all subjects.

## The Vascular Flora of Bill Yeck Park: Supporting the Conservation of Local Biodiversity

College of Arts and Sciences: Biology  
Oral Presentation - Honors Thesis

**PRESENTERS** Taylor Marie Sparbanie

**ADVISORS** Ryan W McEwan

**LOCATION, TIME** Kennedy Union 211, 2:30-2:50

Maintaining and fostering biodiversity is a critical component of natural areas management and conservation because of its known links to ecosystem function and stability. Identifying and documenting species through a floristic inventory is an important strategy for detecting the presence of rare or unique species, as well as invasive species that pose a threat to biodiversity. Bill Yeck Park is a 194-acre nature park maintained by Centerville-Washington Park District and is largely surrounded by residential areas. As urban green spaces like Bill Yeck Park become more and more prevalent and critically important for the provision of ecosystem services in a postmodern, industrialized, and developed world, knowledge of the composition and function of these nature parks become critically important to inform management. Our goal is to generate a list of vascular plant species for the park that can help the park's manager identify critical areas for conservation and better strategize removal of invasive species. Floristic surveys for this project began in March of 2017, and will continue into 2018. Currently, 245 species have been identified and documented across a variety of habitats, including meadows, riparian corridors, and upland forest.

### **Transformations in Hyperbolic Geometries**

College of Arts and Sciences: Mathematics

Oral Presentation - Capstone Project

**PRESENTERS** Jennifer Lynn Brustoski

**ADVISORS** Jonathan H Brown

**LOCATION, TIME** Kennedy Union 312, 2:30-2:50

We can rotate, reflect, translate a shape without changing it. These are called the transformations of Euclidean Geometry. We can define Euclidean Geometry using these transformations. In this talk, we will explore how to move shapes without changing them in hyperbolic geometry. We will include a series of activities to introduce high school students to hyperbolic transformations.

### **Mechanical Testing and Finite-Element Modeling of Polymer Composites and Additively Manufactured Thermoplastics**

School of Engineering: Mechanical and Aerospace Engineering

Oral Presentation - Independent Research

**PRESENTERS** Rockford Raymond Bowman, Alex R Elsbrock

**ADVISORS** Robert L Lowe, Tom J Whitney

**LOCATION, TIME** Marianist Hall Learning Space 218, 2:30-2:50

Woven fiber-reinforced polymer composites (WFRPCs) and additively manufactured (AM) thermoplastics have received increasing interest as candidate materials for structural (load-bearing) applications. Our research consisted of two synergistic parts, one experimental and the other computational. The experimental portion focused on fabricating epoxy-fiberglass WFRPCs with different fiber orientations and using tensile testing to determine their mechanical properties. The computational portion builds on punch test experiments previously conducted at UDRI on additively manufactured polyetherimide (PEI, commercially known as "ULTEM"). We focused on developing predictive finite-element models/simulations capable of capturing (and explaining) the novel deformation, damage, and failure observed in these experiments. Solid models of the disk-shaped test specimens were rendered in SolidWorks, meshed in HyperMesh, and modeled using the finite-element software LS-DYNA.

### **Arts-Based Research in Art Education**

College of Arts and Sciences: Art and Design

Oral Presentation - Capstone Project

**PRESENTERS** R Darden Bradshaw, Morgan Noel Bukovec, Rose C Defluri, Bridget Anne McCafferty

**ADVISORS** R Darden Bradshaw

**LOCATION, TIME** Marianist Hall Learning Space Commons, 2:30-3:30

Senior Art Education students share their individual investigations into arts-based research. Poised to enter the field of art education and tasked with supporting future students in meaningful art making, these preservice teachers explore the various intersections of art, research, and teaching in a fast-paced, visually engaging manner.

### **NFL Roster Analysis of the 2017-18 season, characteristics of NFL players from smaller schools.**

School of Education and Health Sciences: Health and Sport Science

Oral Presentation - Independent Research

**PRESENTERS** Christian Alec Searles

**ADVISORS** Jon K Linderman, Peter J Titlebaum

**LOCATION, TIME** Kennedy Union 310, 2:40-3:00

The NFL is made up of the best players from all over the world, but mainly from top tier-collegiate programs. This study will examine the roster composition of the 32 NFL teams from the 2017-2018 season, focusing on 63 players identified as coming from smaller or lower-tier athletic programs players. Of these players, 53 are on the active roster and 10 are on the practice squad. This presentation examines the frequency of players by position from this uniquely identified population, as well as the physical characteristics of this

population in comparison to NFP roster players from more traditional football schools.

## Generation of Octave Spanning Spectra directly from a Fiber Oscillator with Self-Similar Pulse Evolution

College of Arts and Sciences: Physics

Poster - Graduate Research

**PRESENTERS** Ankita Nayankumar Khanolkar

**ADVISORS** Andy Chinyu Chong, Chunyang Ma (Visiting scholar at UD from Jilin University, Jilin Province, China)

**LOCATION, TIME** Fitz Hall 580, 2:50-3:10

The shortest light pulse that can be generated by a mode-locked laser will always be of fundamental interest to the field of ultrafast science. Mode-locked lasers that produce octave-spanning spectra and few-cycle pulses are very attractive for applications such as frequency comb, high-harmonic generation, and ultrafast spectroscopy. Ti: sapphire lasers still dominate the few cycle regimes with generation of 5 fs pulses and octave spanning spectra directly from laser cavity. Performance of the fiber lasers is improved over the years, but they still lag in terms of high energy and few cycle pulses compared to solid state lasers. We have simulated a mode-locked fiber laser design based on the double clad ytterbium doped fiber with the addition of a dispersive delay line (DDL) before photonic crystal fiber (PCF) and it produced octave spanning spectra extending from 750 nm to 1600 nm (660 nm at -20 dB level). It is scientifically important to realize and stabilize a mode-locked fiber laser with such an extreme perturbation even numerically. To our best knowledge, this is the first numerical evidence demonstrating generation of very broad spectra directly out of a mode-locked fiber laser. Further experimental investigation of this mode-locked fiber laser is currently underway.

## Student Songwriter Concert: Guitar Students of Jim McCutcheon

College of Arts and Sciences: Music

Performance - Independent Research

**PRESENTERS** Caleb Joseph Baron, Jessica L Bullock, Drew Michael Gaboury, Wyatt Michael Nagel, Timothy Daniel Schroeder

**ADVISORS** James R McCutcheon

**LOCATION, TIME** Sears Recital Hall, 3:00-4:00

Guitar students of UD Music Department Artist-in-Residence Jim McCutcheon perform their original songs in this juried event.

## Business that Changed the World and Media Moguls

Center for International Programs: Intensive English Program

Poster - Course Project, 201816 IEP 033 01

**PRESENTERS** Maryam Sulaiman Said SULAIMAN Al Ofi, Hassan Ali A Al Zainaddin, Fahad Y F A A Alduaij, Mahdi M E A H Alsaffar, Muhammad H H H M Alsarraf, Saleh Mohammed

**ADVISORS** Julie Noelle Gee, Nichole M Lucas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The presenters are students from the Intensive English Program. The posters they have created are representative of an end of term project for the level 3 Oral Communication and Listening/Note-taking course; an intermediate class for English language learning students at the intermediate proficiency level. The goal of this assignment is to give students an introduction to research and an opportunity to improve their speaking and presentation skills.

## Regulation of dronc by the Hippo pathway

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Karishma Sanjay Gangwani, Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh, Amit Singh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Hippo pathway is an evolutionarily conserved pathway that regulates organ size and tissue homeostasis in *Drosophila* and mammals. The pathway functions by regulating the nuclear availability of transcriptional cofactor Yorkie (Yki), mammalian YAP, which is regulated by the activity of a core kinase cascade comprising the serine threonine kinases Hippo (Hpo) and Warts (Wts) and their accessory proteins. Yki binds with transcription factors like Scalloped (Sd) or Homothorax (Hth) to regulate target genes involved in cell proliferation and survival. Downregulation of the Hpo pathway causes increased cell proliferation and overgrowth, whereas hyperactivation of this pathway leads to cell death due to activation of these caspases. Previous work in our lab identified the initiator caspase Dronc (mammalian Caspase 9) as a transcriptional target of Yki. Caspase proteins are cysteine aspartic proteases which play essential roles in cellular signaling, development and cell death via apoptosis or Programmed Cell Death (PCD). We found that loss of Hippo signaling leads to downregulation of dronc expression suggesting that Yki could act in co-repressor complexes to provide growth and survival cues to cells where Hippo pathway is downregulated. We hypothesize that Yki functions both as an activator and a repressor simultaneously in association with the TEAD family transcriptional factor Sd to control dronc expression. Here, we present our work on the regulation of dronc by the Hippo pathway, and its implications in organ size control, and in disease

conditions like cancer.

**Monitoring fecal coliform bacteria concentrations for the assessment of recreational safety of kayak chutes in Great Miami River near downtown, Dayton, OH**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Audrey Allison Hayes, Suzanne L Lowes

**ADVISORS** Jeffrey L Kavanaugh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

To determine the potential risks to human health of newly-developed recreational kayak chutes in the downtown Dayton, OH area, surface water samples were collected from sites in the Great Miami River, Mad River, Wolf Creek, and Rubicon Creek. Samples were collected directly from the main river channel adjacent to the kayak chutes and from local stormwater outfalls that empty into rivers and streams near the kayak chutes. Surface water samples were put on ice and taken to the lab where they were cultured in an incubator and counts were made of fecal coliform colonies. Colony concentrations for total fecal coliforms and E. coli regularly exceeded the Ohio EPA's class A standards for recreational waters. It was found that concentrations increased as the water level increased due to heavy precipitation. Future directions include determining the source of the E. coli contamination in the Rubicon Creek outfall, which may reveal the University of Dayton's impact on coliform bacteria concentrations since this is the campus's main outfall into the Great Miami River. We also plan to collect samples from kayak chutes outside of the Great Miami River.

**Sex differences in the antidepressant-like effects of ketamine in an inflammatory mouse model of depression**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Nick Richard Halloy, Benjamin Klocke, Connor F Thelen

**ADVISORS** Pothitos Pitychoutis

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

A major discovery in the treatment of major depression was the finding that a single sub-anesthetic dose of ketamine induces both acute and sustained antidepressant effects in patients. Although women report major depression at twice the rate of men, the vast majority of research on ketamine's antidepressant effects has been focused on the male sex. By inducing neuroinflammation in rodents using the pro-inflammatory agent lipopolysaccharide (LPS), a sickness syndrome is manifested with many behavioral and physiological manifestations that overlap with the clinical symptoms of major depression. The majority of studies investigating the neurobiological effects of LPS have been conducted in the male sex. The antidepressant-like effects of ketamine have only been documented in male LPS-exposed mice. Of note, female responsiveness to ketamine in this neuroinflammatory model of depression remains elusive. In this study, we are investigating the sex differentiated antidepressant effects of both acute and chronic treatment of ketamine on the LPS-induced neuroinflammatory model of depression. Preliminary data from acute ketamine treatment points to a differentiation in behavior in male and female mice. In addition to this preliminary data, we are currently conducting the chronic ketamine administration phase of the study. Data collected by our lab is promising in the search for novel mechanisms for female ketamine response under the neuroinflammatory model of depression.

**Effect of tyrosine kinase inhibitors on Drosophila glioma model**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Kaitlyn M Alleman, Oscar Antonio Barnes Valdejuly, Dudley Kiefer Campbell, Claire Marie Feller, Karishma Sanjay Gangwani, Michael Moran Gilbert, Katie Katherine Parker, Kirti Snigdha

**ADVISORS** Madhuri Kango-Singh

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Glioma are glia-derived primary brain tumors with very poor prognosis. The standard of care is surgery followed by radio- and chemo/immuno-therapy, or combinations thereof, however, all patients with glioma ultimately die. Thus, there is a need to test if recently approved drugs can inhibit the growth and progression of this tumor. We have developed a Drosophila glioma model based on the two genetic/ oncogenic pathways known to be most frequently activated in patients viz., the Ras/MAPK pathway and the PI3K pathway. Inhibitors of these two pathways do not help to limit the progression of glioma. Therefore, it is thought that other oncogenic pathways induce glioma growth and progression. We designed a chemical screen involving drugs targeting Tyrosine kinases (Selleck Biochem Chemical library) – key enzymes that are activated by oncogenic pathways. The chemical screen involves feeding glioma containing larvae 10uM and 300uM drugs from the library at early third instar stage, then allow these larvae to grow and mature to the third instar stage (120h of development), and then dissect the brain to study effects on glioma growth and track survival on days 5-7 when other glioma positive larvae die. Here, we present our progress from this screen focusing on chemicals A2-A11.

**The Effects of Tsetse Fly Beta 2 Tubulin on the Fruit Fly Axoneme**

## College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Elizabeth Marie Kramer

**ADVISORS** Mark G Nielsen

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

There are constraints on the evolutionary process. A big question is how nature can generate alternate forms of a protein without interfering with its function. The beta tubulin protein of the fruit fly spermtail is an example of a protein that has not evolved for millions of years. The ultimate goal of this research is to determine how it evolves when it does. To do this, we need to first determine if beta tubulin tolerates change by testing the ability of a related but different beta tubulin to support the fruit fly sperm tail. In this case, the goal is to determine if *Glossina morsitans* (tsetse fly) beta 2, which is 14 amino acids different, can replace *Drosophila* beta 2 and generate motile sperm. Using genetic techniques we have expressed tsetse fly beta 2 in the fruit fly *Drosophila melanogaster*. We now need to selectively mate fruit flies to generate a fly that is a homozygote for both tsetse fly B2 and the null mutation for fruit fly B2. These flies will then be tested for fertility, TEM cross sections will be taken of the testis, and the testis morphology will be analyzed. If the resulting fruit flies are infertile with immotile sperm, then it is likely that the beta protein co-evolved with another component of the sperm tail. Having to wait for a second protein to evolve would slow the evolutionary process and explain why beta 2 has not evolved for 60 million years. But if the resulting fruit flies are fertile, then evolution took a very narrow path that maintained *D. melanogaster* beta 2 function in the face of 14 amino acid changes.

## Extracellular biofilm polysaccharides-mediated antibiotic resistance of *Pseudomonas aeruginosa*

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Celeste Claire Bergman

**ADVISORS** Yasuhiko Irie

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

High density surface-attached growth of bacteria are called biofilms. This bacterial community secrete extracellular matrix materials, of which the major components are polysaccharides. The polysaccharides serve as adhesion molecules as well as a protective barrier against antibiotics and other antimicrobial compounds. *Pseudomonas aeruginosa* is an opportunistic pathogen, and its propensity to grow biofilms in infected sites causes serious medical problems, often untreatable due to their antibiotic resistance properties. The two major biofilm polysaccharides of *P. aeruginosa* are the PEL and PSL polysaccharides. In this project, we show the relationships between antibiotic resistance and PEL/PSL polysaccharides of *P. aeruginosa* biofilms.

## The Effects of Short Chain Fatty Acids on the Ability of *Listeria monocytogenes* to Form Biofilm

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Jake Edward Thomas

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Introduction. *Listeria monocytogenes* is a common food borne pathogen that can be fatal to those who with compromised immune systems. To combat food borne pathogens, short chain fatty acids are added as food to preservatives. Purpose. The purpose of this experiment was to determine the effects of short chain fatty acids (SCFAs) on the growth of *Listeria monocytogenes*. Specifically, this research looked at the impact of varying amounts of acetate, butyrate, and propionate on the ability of *Listeria* to grow in a biofilm, both aerobically and anaerobically, in polypropylene (PP) and polystyrene (PS) in microwell plates. Results. Under anaerobic, but not aerobic, conditions, *Listeria* planktonic growth increased when SCFAs were added in the culture medium. However, I did not detect consistent results when *Listeria* was growing in the microwell plates. Conclusion. As indicated by these results, *Listeria monocytogenes* planktonic growth can be increased when grown anaerobically with SCFAs. However, future research is necessary to assess the effects of SCFAs on biofilm growth.

## Novel Zinc containing Porphyrin exhibits dark toxicity against an opportunistic pathogenic bacterium grown under planktonic and biofilm conditions

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Nehaben Nik Patel

**ADVISORS** Kristen Krupa Comfort, Jayne B Robinson, Shawn M Swavey

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

One of the greatest threats to human health, and life, is the rise of antibiotic resistant bacterial infections. National summary data from the CDC estimates that at least 2,049,442 million illnesses and 23,000 deaths occur each year as the result of antibiotic

resistant bacteria and fungi. Additionally, 250,000 illnesses and 14,000 deaths are caused by the bacterium *Clostridium difficile*, considered to be related to antibiotic resistance and use. We are the co-inventors of two patented novel technologies for the treatment of antibiotic resistant bacteria. Both treatments make use of a novel porphyrin ZnP (US Patent # 9,364,537) that does not require using traditional photo-activation i.e., it exhibits unique dark toxicity. In standard tests against planktonic cells ZnP exhibits broad spectrum activity, for example it is bactericidal towards: *Pseudomonas aeruginosa* (MIC<sub>90</sub> at 25µM), MSSA and MRSA strains of *Staphylococcus aureus*, as well as *Listeria monocytogenes* and *Mycobacterium smegmatis*. In toxicity testing using lung alveolar cells no toxicity was detected at concentrations that were 2-fold higher than the MIC. We have demonstrated that *P. aeruginosa* (PAO1) cells take up ZnP rapidly and accumulate it inside the cell. In cells treated with 25 µM ZnP there was a substantial loss of chromosomal DNA after as little as 5h; with an almost total loss at 50 µM. Additionally, we have tested various uptake/transport systems in PAO1 that aid in uptake of ZnP. In biofilm experiments, ZnP was able to disrupt 16h preformed biofilms on Polyethylene (PE) and stainless steel surfaces by 2 logs and, more interestingly, prevent the formation of biofilms when PE surface was pretreated with 25µM ZnP compared to the control.

## **The role and evolution of the Dopa decarboxylase gene in the origin of a derived dimorphic fruit fly pigmentation trait**

College of Arts and Sciences: Biology

Poster - Graduate Research

**PRESENTERS** Sumant Grover, Becca Jo Kaiser

**ADVISORS** Melissa E Williams, Tom M Williams

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Understanding the genetic and molecular underpinnings for trait diversity remains a central goal of evo-devo research. Traits arise by the orchestrated expression of numerous genes in a gene regulatory network. Remaining poorly understood is how these networks and their expression patterns are initially assembled and subsequently diversify. Gene expression is controlled by DNA sequences known as cis-regulatory elements (CREs) that possess binding sites for transcription factors whose binding drives a specific pattern of expression. It is anticipated that gene expression evolution often occurs through the formation, modification, and destruction of CREs, presumably by changes that create or destroy binding sites for transcription factors. However, the binding site level of CRE evolution has been worked out in few cases. The fruit fly species *Drosophila melanogaster* has a male-specific pattern of abdominal pigmentation for which the enzyme encoding genes and several of their expression-regulating transcription factors are known. However, the details of how these regulators interact with CREs remain largely uncharacterized, including the Dopa decarboxylase (*Ddc*) pigmentation enzyme gene. Here we share the results of our efforts to uncover the CRE-basis of this gene's expression pattern, and how this regulation and pattern of expression evolved during the origin of this male-specific trait.

## **The Survival Rate of Listeria in Dairy Products Compared to Pathogenic E. coli**

College of Arts and Sciences: Biology

Poster - Independent Research

**PRESENTERS** Megan Ashley Marasco

**ADVISORS** Yvonne Y Sun

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

*Listeria monocytogenes* is a deadly human pathogen frequently found in dairy products. Its ability to grow and survive in the cold contributes to frequent contaminations despite the presence of food preservatives, such as propionate. In my research, I first studied how effective propionate is against *Listeria* in dairy products, including three types of milk, 2%, fat free, and chocolate, all with and without propionate. Then I compared the survival of *Listeria* to survival of pathogenic *E. coli* in propionate-supplemented milk by monitoring the number of surviving bacteria 1, 2, and 3 days after storage in the refrigerator. I found that propionate is effective against *Listeria* only in 2% milk and is effective against *E. coli* only in fat free milk. Therefore, the efficacy of propionate depends on the types of dairy products as well as the types of foodborne pathogens. When one is developing food preservation methods, it is important to consider the different types of food and foodborne pathogens.

## **Compartmentalization and Temporal Distribution of L-DOPA-Containing Proteins Involved in Oyster Shell Formation**

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Benjamin Nicholas Schmeusser

**ADVISORS** Douglas C Hansen, Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Marine molluscs, such as *Crassostrea virginica* (eastern oyster), produce structural proteins that are essential in adhesive strategies and shell biomineralization. The unique properties of these proteins derive from the amino acid composition. L-3,4-dihydroxyphenylalanine (L-dopa), which is a unique key amino acid in the cross-linking of these proteins, can be considered a biomarker for identification and localization of shell formation proteins. The focus of this research was to determine the compartmentalization of L-dopa-containing proteins involved in the process of biomineralization in *C. virginica* at different time points during a shell repair event. Three organismal compartments were identified as possible locations of L-dopa precursor proteins: hemocytes,

cell-free hemolymph, and mantle tissue. Hemolymph was harvested from the adductor muscle of notched oysters and hemocytes were subsequently collected via hemolymph centrifugation. Mantle tissue was collected from specific locations. The product of repair, nascent shell deposited in the notch, was collected at discrete time points post-notching. Amino acid composition related to time since notching was determined via anion exchange HPLC with pulsed amperometric detection. Additionally, the Arnov Assay (specific for catechols) was used to stain for L-dopa in the samples. Preliminary data reveal increased L-dopa concentrations in hemocytes and hemolymph at 24-48 hours and 96 hours post notching, respectively, indicating a mobilization of resources for shell repair. These data support the hypothesis that L-dopa-containing proteins are involved in oyster shell formation and that they are distributed at discrete locations within the organism.

## Molecular Modeling and Characterization of a Mussel Adhesive Protein (Mefp-5)

College of Arts and Sciences: Biology

Poster - Honors Thesis

**PRESENTERS** Kathryn Rose Zimlich

**ADVISORS** Douglas C Hansen, Karolyn M Hansen

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The blue mussel, *Mytilus edulis*, secretes adhesive proteins to facilitate adhesion to a variety of substrates. Several *Mytilus edulis* foot proteins (MeFP) have been isolated and characterized. MeFP-5 is said to be the most adhesive of these proteins, and has a comparatively large molecular percentage of L-Dopa when examined against MeFP proteins 1-4 at over 25% L-Dopa, if full conversion from tyrosine occurs. The catechol functional group of L-Dopa complexes with Fe<sup>3+</sup> to form organometallic linkages, but how L-Dopa in MeFP-5 is interacting with an iron oxide surface, and if the lysine amino acids adjacent to L-Dopa help to facilitate formation of the epoxy-like barrier on iron oxides, is unknown. This project focuses on evaluating the orientation of the catechol groups in L-Dopa through molecular modeling, generating a 3D model of an iron oxide surface, characterizing regions of MeFP-5 which are most likely to complex with Fe<sup>3+</sup>, and altering the amino acid composition of MeFP-5 to attempt to maximize adhesive properties and explore possibilities for creating a synthetic analog. Modeling is done in the programs ChemDraw® and Chem3D® (PerkinElmer) to analyze protein structure and the catechol positioning of L-Dopa within the protein MeFP-5. To validate and refine the model, experimental data of MeFP-5 adsorbed onto HY80 steel using Raman infrared spectroscopy have been used to determine what interaction the lysine and L-Dopa functional groups in MeFP-5 have on the steel surface. These data have been incorporated into the 3-dimensional model of the protein-metal interface.

## Efflux Pump Inhibition in Multiple Antibiotic Resistant Bacteria

College of Arts and Sciences: Chemistry

Poster - Honors Thesis

**PRESENTERS** C.J. Roger Moellering

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Over the past few decades, bacteria have become resistant to multiple antibiotics due to humans misusing and overusing antibiotics. Over-expression of bacterial efflux pumps has been identified as a key player in bacterial drug resistance. Over-expression of these pumps essentially allows bacteria to transport antibiotics from their intracellular space to their extracellular space before the antibiotics can effectively act on the organisms. To combat multiple drug resistance in bacteria, this research aimed to find natural, plant-derived inhibitors of an efflux pump in *E. coli* called the AcrAB-TolC pump. Cinnamon, cranberry, pumpkin seeds, thyme, black tea, and oolong tea were chosen for testing for inhibition of this pump. These items were ground, dried, and put in an extractor to isolate polar compounds which were eventually introduced into a bacterial fluorescence assay. Ultimately, the oolong tea was the only extract tested that led to a positive fluorescence reading, reflecting potential inhibition of the AcrAB-TolC pump. Isolation and purification of the active compound within oolong tea still an ongoing area of investigation.

## Combating Antibiotic Resistance in Multidrug Resistant Bacterial Cells using Plant Derived Inhibitory Compounds

College of Arts and Sciences: Chemistry

Poster - Independent Research

**PRESENTERS** Emily Marie Jones

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Bacteria have steadily developed defenses against antibiotics since the world's first fleet of antibacterial drugs was introduced. One strategy that bacteria can use to become multi-drug resistant involves the use of large, membrane-embedded efflux pumps, such as the AcrAB-TolC pump found in *Escherichia coli* (*E. coli*) and other Gram-negative bacteria cells. The most antibiotic-resistant cells are those which over-express the genes that code for this large efflux pump, and this gives the bacterium the capability of transporting a wide variety of compounds out of the cell, including antibiotics that we use to combat bacterial infections. The overexpression of these bacterial efflux pumps renders our antibiotics ineffective. To combat this antibiotic-resistance strategy, I will be analyzing plant extracts to identify new compounds that can block the activity of bacterial efflux pumps and restore the effectiveness of existing antibiotics. Fourteen roots, shoots, fruits, seeds, and leaves will be tested using a fluorescence-based efflux assay and any

extracts that show inhibitory activity will be analyzed so that the active compound can be identified. This research could open up a new avenue in the treatment of multi-drug resistant bacterial infections.

### **Methods of Blocking Efflux Pump Activity in Escherichia Coli**

College of Arts and Sciences: Chemistry

Poster - Graduate Research

**PRESENTERS** Erich Nicholas Auer

**ADVISORS** Matthew E Lopper

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Overuse of antibiotics throughout the developed world has contributed significantly to the emergence of antibiotic-resistance in bacteria. Although this helps bacteria it is extremely harmful to humans. As bacteria adapt to the antibiotics, current treatments become ineffective and bacterial infections can become life threatening. One of the mechanisms that bacteria, such as E. Coli, use are efflux pumps. Efflux pumps are capable of taking potentially harmful substances, like antibiotics, from inside the bacterial cell and moving them out. This allows the bacterium to escape from the killing effects of the antibiotics. My hypothesis was that a natural product, small molecule compound, or DNA aptamer would be able to bind to some part of the tri-part structure of the efflux pump and block its activity. The results showed that there are some promising compounds but none that were actually capable of blocking activity to a significant degree.

### **Dental Health Beliefs of Chinese College Student based on the Health Belief Model**

College of Arts and Sciences: Communication

Poster - Graduate Research

**PRESENTERS** Peijun Hou

**ADVISORS** Angeline L Sangalang

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Dental health problem is a serious and underexplored topic in China. This study used Health Belief Model to investigate the health belief of dental health promotion behavior among Chinese college students at University of Dayton. The results indicated that laziness is the biggest barrier for daily brushing behavior, while most of them also lack knowledge about flossing. The barriers to annual dental check-ups include expensive cost and disregarding the importance of oral health. The study also examined the preference of information seeking and scanning channel about dental health-related information. Most respondents come across information about health-related knowledge through social media and mass media, though they prefer to search such information through dentist and social media. Most participants think their dental health-related knowledge is moderate. One the most interesting findings is about self-efficacy, as most of Chinese students answered they have no idea when they were asked self-efficacy related questions such as "What can improve someone's confidence on flossing daily?". Consider the concept "self-efficacy" was built under Western culture and society, even though self-efficacy has been shown to be a strong predictor of performance with Western populations, whether self-efficacy can predict performance with non-Western populations is still not clear.

### **Ethic Issues in Journalism: Reporting Truth while Respecting Privacy**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Elizabeth Grace Elward, Mari Margaret Fazio

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Mari Fazio looks at how the press covers private individuals who have been thrust into the public limelight through, for example, natural disasters. Fazio addresses how journalists can report the news and still respect people's privacy. Elizabeth Elward considers the long-standing debate in journalism on when, if ever, the press should identify victims of sexual assault. Elward explores the ethical issues involved, especially in light of today's openness, and what might be the best course of action today.

### **Ethic Issues in Journalism: Maintaining Journalistic Independence**

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Christopher James Lareau, Emily M Lawton

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Christopher LaReau examines sports journalism and conflicts that arise when journalists report on hometown and favored sports teams. He identifies how journalists can maintain their objectivity in order to report fully and truthfully. Emily Lawton examines the challenges that arise when news organizations' business interests become news. She identifies how journalists can maintain their journalistic integrity while reporting on their own employers.



## Ethic Issues in Journalism: How Much is Too Much to Report?

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Tyler Kent Jones, Kelsey Elizabeth Kramb

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Tyler Jones looks at the public's right to information about government, journalists' duty to serve the public, and government's need to keep secrets in the national interest. Jones examines when, how and to what extent journalists should disclose classified material. Kelsey Kramb looks at the ethical minefields that arise during breaking news events. She examines how the reporters can adhere to journalistic values and ethics in situations where truth is not always immediately apparent. When and how much information should journalists disclose in such cases?

## Ethical Issues in Journalism: Minimizing Harm when Reporting on Children

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Meg Elizabeth Gramza, William Lawrence Wharton

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Meg Gramza explores the ethical challenges the press faces when reporting on sex trafficking, especially when victims are children. She recommends how journalists can meet their obligation to report truth and do so thoroughly, while minimizing risks of additional harm to the victims. William Wharton explores the ethics involved in photographing children who have been victims of crime and how photojournalists can avoid adding to children's trauma.

## Identifying Stigma Cues in Network Television Content: Implications for Stigma Reduction Strategies

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 390 P3

**PRESENTERS** Livvie Mae Roberson, Julia D Wenderski, Nicolette Ann Westberg

**ADVISORS** Angeline L Sangalang

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The present investigation is exploring the presentation of stigmatized health conditions (such as mental illness, HIV/AIDs, etc.) in network television content. The study employs a stratified representative sample of news, entertainment, and commercial programming from four major television networks: ABC, CBS, NBC and Fox. More specifically, we are exploring information and depictions of predictors/causes, health consequences, social consequences, markers of illness, treatment, and prevention for the health conditions. Our work contributes to the literature in two key ways as past research has: 1) often limited discussions of stigma to a single, specific context, and 2) been limited to a single type of programming. Exploring patterns and consistencies in stigma representation across health issues and across message types can provide guidance for stigma reducing message strategies for an array of health contexts and future contexts that arise.

## Ethic Issues in Journalism: Interviewing Victims

College of Arts and Sciences: Communication

Poster - Course Project, 201810 CMM 381 01

**PRESENTERS** Molly Marie Clayton, Elizabeth C Dolehide, Caitlin Rebecca Marshall

**ADVISORS** Annette M Taylor

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Molly Clayton, Elizabeth Dolehide and Caitlin Marshall examine ethical challenges that arise when journalists interview people who have been involved in tragic events, children who have been victims of crime, and people who have been sexually assaulted. The interviewing process can be cathartic for the interviewees, but it also can provoke traumatizing memories. Clayton, Dolehide and Marshall look at journalists' interviewing techniques in these specific situations, explore the potential problems, and suggest ways that journalists can be more sensitive in their interviews while still meeting their obligations to report the truth and serve the public.

## Autonomous Self-Driving RC Car

College of Arts and Sciences: Computer Science

Poster - Capstone Project

**PRESENTERS** Kenneth Bester, Garrett M O'Grady

**ADVISORS** Rusty Olen Baldwin

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

With the age of automation coming to machines, self driving cars will turn from a fantasy to a reality in the next decade. These machines will utilize neural networks to learn from pilot drives to ultimately be able to drive completely autonomously on any road they are put on. This project demonstrates a small fraction of the technology that goes behind a self driving car with an implementation on a 1/16th scale RC car. Using the open source software 'Donkey Car' we were able to turn an RC car into a self driving car that get more intelligent every time it drives. Mounted above the car is a 3D printed roll cage which houses a fisheye lense camera (for image recognition) raspberry PI 3 Model B (for the neural networks) and a Servo Controller(to control the throttle and steering). As a demonstration during the presentation, the car will drive simultaneously around a track avoiding obstacles, following street laws and remaining between the lines of the road.

### **HeadEx: Real-time Event Extraction and Interlinking from News Headlines**

College of Arts and Sciences: Computer Science

Poster - Graduate Research

**PRESENTERS** Matthew A Weiler

**ADVISORS** Saverio Perugini, Saeedeh Shekarpour

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In the world today, there is a lack of useful and quality approaches to structuring and semantically annotating data-sets from real-time news outlets. This research represents an essential pipeline and implementation to such a problem and includes background data modeling, event and entity annotation, and finally interlinking events from real-time sources such as twitter headline news sources.

### **Partnering with IEP Students to Improve Nutrition Label Education and Literacy**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Olivia Louise Bittner, Brian Douglas Davidson, Natalia Marie Iannarino, Caroline Marie Symons

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Many health care documents are written at too high a reading level for a majority of the U.S. population to comprehend. In an effort to address this problem, we revised a previous existing document on how to read a nutrition label. The original document was intended for children, but through testing it was determined to be written at approximately a ninth grade reading level. We visited a classroom of ten, level two Intensive English Program (IEP) students who wanted to learn more about understanding American nutrition labels to determine what information they are interested in. Within this visit we learned that the students understood the components associated with an American nutrition label, but wished to learn more about what foods are important to include in a healthy diet compatible with their cultural and dietary preferences. In order to cater to the IEP students, we revised the original document to approximately a fourth grade level and paid specific attention to formatting to prevent distraction from key information. We utilized culturally appropriate images and words so that these students could better understand the presented information. After revision, we presented our improved document to the IEP students to receive feedback on the readability and comprehension. With their feedback, we further revised our document so that it would more effectively communicate this information.

### **Adapting an existing health document to increase awareness about dietary supplements for the Intensive English Program**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Ibrahim Khaleel Alsulaimani, Maris O'Malley Ebeling, Emily Margaret Flaherty, Catherine Victoria Matheny

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Health literacy can be defined as an individual's ability to understand health information and integrate the information to make informed decisions in order to reduce health risks and enhance overall quality of life. We partnered with the Intensive English Program (IEP) to revise an existing health document about dietary supplements for students in this program. First, we met with level two IEP students to assess their initial knowledge of dietary supplements and to determine how the document should be tailored to meet their health literacy needs. The initial document had a readability level of 12.0 according to the Microsoft Flesch-Kincaid readability tool and the Simplified Measure of Gobbledygook (SMOG) tool had a reading level of 13.5. Our goal was to adapt the existing health document to a 3.0 to 4.0 reading level for IEP students. This was accomplished by reducing sentence structure complexity and eliminating complex terminology. This project brought to light the need for developing and adapting existing healthcare documents for marginalized audiences with low health literacy.

### **Creating a More Effective Explanation of Concussions for Intensive English Program Students**

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Taylor Morgan Balk, Mark D Bugada, Caroline A Lynch, Olivia Marie Stanforth

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Low health literacy is a huge obstacle in communicating medical conditions and information to patients. An additional obstacle is created when physicians are communicating with international patients whose primary language is not English. The purpose of this project was to present written information on concussions to international students in the Level 2 Intensive English Program (IEP) at the University of Dayton in a format that they could read comfortably. For our methods, we went into the IEP classroom to assess the students' knowledge of concussions. We then used the information the students provided along with an original fact sheet produced by the Center for Disease Control to create a brochure that would help the IEP students better understand concussions. We altered the original document's wording, format, and content in order to display the information to the students so that they could better understand the material. Our document focused specifically on what a concussion is, its symptoms, and recovery tips. This final brochure corresponded with the IEP students' reading level and allowed them to comprehend the information more clearly.

## Improving Health Resources on Snoring to Increase Intensive English Program Students' Understanding

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Andrew J Deak, Adriana Beatrice Figueroa Santiago, Carrie Anne Siekierski

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Health literacy is defined as the wide range of skills that people develop over their lifetime to comprehend and use health information to make informed choices, reduce health risks, and increase quality of life. In an effort to address the problem of health literacy, we worked with students in level two of the University of Dayton's Intensive English Program (IEP) to develop a helpful health resource about snoring. After learning from the students what they wanted to know about snoring, we were able to choose an existing health text that required a high level of literacy in order to achieve understanding. Using that text, we created a new fact sheet with important information about snoring and delivered that information in a way that made it understandable for the IEP students. After field testing our document with the IEP students, we were able to use their feedback to make improvements and ensure the material was easy to understand. As a result of this work, after performing several analysis tests, we determined original document had an average readability level of 9.7 and rewrote it to require an average reading level of 3.9, cutting the literacy level required down by more than half. This project worked to demonstrate how to reduce the readability challenges of a health document for people of lower literacy levels in order for them to understand important health information.

## Understanding the Intricacies of Obesity

College of Arts and Sciences: English

Poster - Course Project, 201810 ENG 366 01

**PRESENTERS** Maddy Rae Dutton, Joseph Cole Emery, Dana Lynn Pflugrad, Collin Robert Rook

**ADVISORS** Ann E Biswas

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Health literacy refers to one's understanding of healthcare information and the ability to make informed decisions when it comes to health benefits and risks. Obesity is a major health epidemic, so we analyzed and revised a health document from the Obesity Action Coalition website to enhance the understanding and readability of the document for the University of Dayton's level two Intensive English Program (IEP) students. The original document required a college-age reading level. The IEP students read at a 3rd or 4th grade level, so this document was not appropriate for this audience. We visited with the IEP students to gather information about what they already knew about obesity, what they wanted to know more about, and if they had any questions pertaining to obesity. We were then able to create a new brochure for them, making sure to address the information that was of interest. During our field test with the IEP students, we presented our draft in order to receive comments and questions. After the field testing and running SMOG and Flesch-Kincaid readability tests on the original and drafted documents, the final brochure was created and the IEP students reading level was attained. The document our group created allowed the IEP students to better understand important information about obesity, which was lost in the original document. This revision process shows how important it is to assess the readability of health documents and to make them appropriate for a specific audience.

## Contrasting Patterns of Small and Large Glacial Lake Evolution in the Nepal Himalayas

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Katherine A Strattman

**ADVISORS** Umesh K Haritashya

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The objective of this research is to assess annual ice velocities of three Himalayan glaciers in the Mount Everest region of Nepal. Glaciers worldwide are important indicators of climate change due to their tendencies of attaining equilibrium under changing

climatic conditions. Imja, Lower Barun, and Hongu glaciers and their respective proglacial lakes have responded by retreat and growth, but at varying rates. Imja and Lower Barun Lakes have grown rapidly, but Hongu Glacier Lake has shown relatively slower growth. Despite the little accelerating growth of Hongu Glacier Lake, the moraine is composed of unconsolidated and unstable material, and poses the threat of an outburst flood due to less freeboard area. Therefore, it is important to monitor the development of all three lakes, as well as consider fluctuations of surface velocity. Using Landsat satellite imagery, I assessed the annual changes in surface ice velocity from 1992 to 2017. The yearly images were used as inputs to COSI-Corr, a co-registration and sub-pixel correlation software, to track changes on the glaciers surface. My results indicate short-term variations, despite all three glaciers' location within the Mount Everest region, as well as similar long-term trends. Specifically, Imja, Lower Barun, and Hongu glaciers have shown long term trends of decreasing surface velocity, with varying rates of flow within each yearly pair. The three proglacial lakes have all grown at different rates as well, with Imja showing very rapid growth since the 1960s, Lower Barun showing decelerating growth, and Hongu showing very little growth. Understanding the dynamic nature of surface velocity can provide insight on overall glacier health, and may reveal how glaciers respond under rapid lake growth.

## **Exploring the impact of El Niño and La Niña on $\delta D$ and $\delta^{18}O$ patterns in global precipitation using ArcGIS software**

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Amber Johnson

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This study aims to determine the impact of El Niño Southern Oscillation (ENSO) events on the environmental factors (including temperature, latitude, elevation and precipitation amount) controlling stable isotopes in precipitation utilizing regression models in the ArcGIS software. Stable isotope ratios ( $\delta D$  and  $\delta^{18}O$ ) of precipitation have been documented to be directly dependent on changes in temperature and precipitation amount in temperate and tropical regions of the world, respectively (Dansgaard, 1964). During El Niño and La Niña Southern Oscillation events, many regions of the world experience changes to temperature and precipitation amount, with some regions becoming cooler and wetter, others becoming warmer and drier, and many others experiencing patterns in between (Trenberth, 1997). Using ArcGIS, global maps will be created showing the variation in  $\delta^{18}O$ , temperature, latitude, elevation and precipitation amount for six selected years corresponding to strong El Niño, strong La Niña, and normal climatic conditions. Regression models will be performed by climate zone of the world (temperate, tropical, polar) to determine the relationship between environmental factors and  $\delta^{18}O$ . For normal years, the relationship between temperature and  $\delta^{18}O$  in temperate regions should be approximately linear ( $R^2 \sim 1$ ) and a positive trend, while the relationship between precipitation amount and  $\delta^{18}O$  in tropical regions should show a negative trend. The  $\delta^{18}O$  ratios in regions of the world that become cooler and wetter during ENSO events could be more depleted than during normal years, while regions that become warmer and drier will have more enriched ratios than during normal years. This project has immense significance in its potential to predict future patterns of  $\delta^{18}O$  globally during ENSO events, impact groundwater mass balance models, influence resource allocation in regions heavily impacted by ENSO events, and produce more accurate isotope-based paleoclimatic reconstruction models.

## **Assessing Inundation Risk and Possible Race and Income Correlations**

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Ryan M Matzuk

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project has two objectives: (1) map areas vulnerable to inundation and (2) determine whether or not there is a racial or income disparity between the citizens of Harris County, TX at risk of inundation compared to those not at risk. Harris County is a relatively flat, near-coastal, highly urbanized, and low elevation area. This makes it highly susceptible to inundation issues from both sea level rise and high-precipitation storms such as hurricanes. Risk areas will be determined by utilizing Hurricane Harvey precipitation data to mimic a large, high-precipitation storm as well as by utilizing sea level rise projection data for the year 2100 to reveal inundation and land-loss from rising sea levels. This analysis will be performed using multiple digital elevation models (DEMs) from 2008 to precisely measure land-surface elevation of the study area. Hurricane Harvey precipitation data will be used in order to replicate precipitation conditions of large storms. The precipitation data will be used to create a map layer in order to visualize the areas at high risk of inundation. A similar map will also be created using sea level rise predictions for the year 2100. Census block data will be applied to the study area and analyzed in order to determine racial and mean income statistics for areas inside and outside of the high-risk floodplains. This study can provide critical information needed for future planning to address climate change as well as environmental justice issues.

## **Wildfire-induced mass movement susceptibility of the coastal region of northern California**

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Amaris Rodgers

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The objective of this study is to identify areas susceptible to landslides caused by wildfire damage. Wildfires and mass movement are linked by a number of factors. Wildfires not only clear areas of trees and other vegetation, but the roots can be decomposed by the lack of certain nutrients that are practical for vegetation growth that were burned away. The soil also loses its strength and exposes readily erodible materials. The potential for erosion of the areas increases with these factors impaired. Data and other studies have shown that the physical and chemical changes to an area that has experienced a wildfire is at a higher risk for landslides even with average rainfall. The risk is greater in a watershed where large amount of precipitation drained into multiple outlets. The precipitation can greatly agitate the damaged land that is now looser and easier to saturate, causing it to flow. The last five summers California has experienced record-low rainfall and record-high temperature, with longer and more frequent wildfire, making it more susceptible to landslides. The goal of this project is to assess such landslide risk in Trinity Watershed in California because of its recent wildfires and its average to above average rainfall. The significance for this work is to have a better risk assessment to predict the occurrences and damages of this particular natural disaster.

## Assessing Connecticut's flood risk using multi-criterion analysis and its implication to environmental justice

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Julie Hays

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project aims to achieve two objectives: 1) develop a flood risk map for the state of Connecticut using a multi-criterion approach based on geographic information system (GIS) techniques and compare the result with Connecticut's Flood Insurance Rate Map (FIRM) and 2) investigate the issues of environmental injustice related to the direct financial impact caused by flood insurance policies. The flood risk map is generated using publicly available data and GIS tools. To account for the many elements which are involved with flooding, the Analytical Hierarchy Process method is used to assign a weighted numerical value to the parameters which contribute to flood vulnerability. The flood risk parameters chosen to be included in the study follow the FIGUSED method: flow accumulation (F), rainfall intensity (I), geology (G), land use (U), slope (S), elevation (E), and distance from drainage network (D). The net vulnerability of an area due to these parameters is referred to as the Flood Hazard Index value (FHI). Census data is then used to determine if socio-economically disadvantaged groups are at disproportionate risk. The variables that characterize such groups include race, level of income, and level of educational attainment. The significance of this study is to identify the possibility of minority communities being disproportionately affected by a federal policy regarding flood insurance, providing information for the equitable implementation of its policies.

## Understanding Surface and Ground Water Interaction, and Water Quality using Stable Isotopes and Major Ions

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Caroline Johnstone

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Stable isotopes of oxygen and hydrogen are conservative dual tracers and provide key information about movement of water in the hydrologic cycle. Surface and groundwater are important components in the water cycle that variably interact depending on geology, topography and rainfall seasonality. Understanding the degree of this interaction is critical to determine both the quality and quantity of water. Here, we use stable isotopes of oxygen and hydrogen, and geochemical analysis of water to quantify the degree of interaction between surface and groundwater. This approach solely depends on the water chemistry and unique isotopic composition of seasonal rainfall, surface and groundwater. Water isotope data in this region is very limited to monthly precipitation isotope data in Coshocton, OH monitored by the Global Networks of Isotopes in Precipitation. To fully use this powerful tracing technique in hydrology, water resources and climate studies, establishing the seasonal variability of water isotopes in the surface and groundwater is a critical first step. Here we present a weekly water isotope data collected at four locations, Still Water River, Mad River and two locations at the Great Miami River. River and groundwater sample collection for isotopic and geochemical data analysis will continue the rest of the year to obtain seasonal isotope end members. However, our preliminary data collected for fall 2018 shows that the average isotopic composition of the river is 6.82‰ for  $\delta^{18}\text{O}$  and 43.24‰ for  $\delta^2\text{D}$ , and groundwater average 7.08‰ for  $\delta^{18}\text{O}$  and 44.46‰ for  $\delta^2\text{D}$ . Using this data, we employed an isotope mass balance to determine the degree of surface and groundwater interaction. Preliminary results suggest that the Miami River could contribute up to 90% recharge to the buried aquifer. The overall outcome of this research will help to quantify seasonal groundwater recharge and determine the fate of contaminants to the local aquifer.

## Climatic controls on the stable isotopic composition of precipitation in Ethiopia

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Colin McTighe

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project aims to determine what major climatic factors control the variation of the stable isotopic composition of precipitation in Ethiopia. In the past, the variations of stable isotopes of precipitation have been linked to the North-South migration of the Intertropical convergence zone (ITCZ). However, recent studies suggested that the link between the ITCZ and the arrival of rainy seasons in Ethiopia do not provide enough explanation for the precipitation isotope values. In this study we examine the stable isotope values of precipitation for four stations throughout Ethiopia from August 2012 – August 2013, and determine how they are affected by a variety of climate factors including: local temperature and precipitation amount, sources of moisture (established through HYSPLIT modeling), convective intensity of moisture source region (estimated by the Outgoing Longwave Radiation (OLR)), wind circulation patterns, and moisture flux and transport. Our results will provide more insight to the control of precipitation isotopes in the tropical region, which is important for accurate interpretation of climate proxy data.

### **Utilizing GIS and Multi Variable Analysis to determine optimal wind farm site locations in Ohio**

College of Arts and Sciences: Geology

Poster - Capstone Project

**PRESENTERS** Kyle Hrabak

**ADVISORS** Shuang-Ye Wu

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project aims to determine the most optimal locations for the implementation of utility scale wind farms within the state of Ohio. The use of fossil fuels for electrical energy production is one of the world's largest contributors to the growing atmospheric concentration of carbon dioxide, known for having long term impacts on climate. Developments and growth in the clean energy sector have offered alternatives to current dominant methods of energy production, with specific focus into wind powered electrical generators. Wind turbines are a carbon free source of energy, but are limited in use due to restrictions of needed wind energy. This form of energy is widely available in enough quantities across the Midwest region to be a viable source of electrical generation. As such this project aims to look at all variables that need to be taken into account to determine optimal sites for wind farms in the state of Ohio. Factors of consideration include wind energy, land cover, soil type, roughness of terrain, elevation, slope, orography, road access and environmental impacts. Data regarding all of these factors is collected and processed using a geographical information system, ESRI ArcGIS, creating a spatial representation of suitable areas for development. Within the GIS system, an analysis technique known as multi-variable analysis is conducted assigning weights to various factors and calculating an overall suitability score to be ranked and investigated as optimal sites. The finding of this report are to provide a starting point for clean energy implementation in the state of Ohio for which currently only has renewables accounting for 3% of the state's energy production.

### **Analysis of Environmental Effects of Chemical Deicers in the Southwestern Ohio**

College of Arts and Sciences: Geology

Poster - Course Project

**PRESENTERS** Christopher Alexander Barrett

**ADVISORS** Zelalem K Bedaso

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In the modern age, virtually every sphere of society uses various manufactured chemicals. Factories use various lubricants to improve machine up time, sanitation crews use disinfectants to annihilate bacteria, and farmers use specialized fertilizer to improve crop growth. The use of these chemicals can be extremely helpful, and in some cases necessary to keep the wheels of modern society rolling. However, while these chemicals help, in some cases they can be very hazardous to individuals or the environment if not handled properly. This is the case with excessive use of chemical deicers that can runoff from roads into water and negatively affect freshwater wildlife. This project uses deicers as an example for the potential health and ecological effects that can be caused from the use of environmentally harmful chemicals, and attempts to highlight practices that minimize these risks.

### **Niagara Falls in Ohio? – geomorphological and geological expression of the Niagara Escarpment in the vicinity of Dayton, Ohio**

College of Arts and Sciences: Geology

Poster - Course Project, 201810 GEO 495 01

**PRESENTERS** Thomas Daniel Bashore, Deja Juanita Branch, Frances Coletta Jelinek

**ADVISORS** Michael R Sandy

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Niagara Escarpment is a significant landform that runs for hundreds of miles in the northern United States and Canada; from eastern Wisconsin through Ontario to central New York State. The most famous part of this feature is no doubt the Niagara Falls

and the Niagara Gorge on the Niagara River, between New York State and Ontario. The geology underlying the Niagara Escarpment comprises Paleozoic Era sediments: Silurian carbonate rocks that are more resistant to erosion overlying more easily eroded sediments from the Ordovician Period; conditions necessary for a waterfall to form. This pattern can be traced along the length of the Niagara Escarpment. What is perhaps less well-known is that in the Dayton area the same age rocks outcrop in a similar relationship along the rim of the Cincinnati Arch expressed at a number of local scenic sites (parks and reserves): for example, Glen Helen, Clifton Gorge, Charleston Falls, Patty Falls (Englewood Metro Park); many with waterfall features clearly not as high as at Niagara Falls but with the same basic geological framework as the latter. The local expression of the Niagara Escarpment is due to an isolated geological inlier, where older rocks (Ordovician age) are overlain by Silurian rocks. We have investigated the geology and geomorphology of some sites in the Dayton area along SW Ohio's Niagara Escarpment. It is possible to document variation in the geology of the escarpment depending on location along the Cincinnati Arch and depth of erosion. Geomorphological features associated with karst landscapes (limestone solution) of the Silurian sediments have also been investigated. In addition the potential to develop educational materials on this local resource is being explored.

## The Irish Question: Woodrow Wilson, the Irish, and Irish-American Diplomacy

College of Arts and Sciences: History

Poster - Honors Thesis

**PRESENTERS** Ryan Joseph Westerbeck

**ADVISORS** William V Trollingier

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Irish Question was the title often given to nationalist and independence movements in Ireland in the early 20th century. Several attempts were made to secure Ireland's independence in the early 1900's, the most famous of which is the Easter Rising in 1916. This thesis concerns the period immediately following those events, from 1916 through 1920. The end of the Great War caused many nations to look for independence and international recognition at the Paris Peace Conference, often due to President Wilson's own words. During this period, several prominent Irishmen and Irish Americans attempted to reach out to President Wilson to support the Irish independence movement. These attempts were unsuccessful. The following thesis will explain how the representatives of the Irish cause attempted to convince Wilson and the reasons why they failed in securing the support of the United States government.

## My Semester of Service at the Brunner Literacy Center

College of Arts and Sciences: History

Poster - Course Project, 201810 UDI 393 01

**PRESENTERS** Fiona Marie Madden

**ADVISORS** Christopher S Agnew

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Brunner Literacy Center serves the considerable but largely unrecognized segment of the adult population with low literacy skills. By working with individuals to improve their reading skills, earn their GED, or learn English as a second language, we empower them to improve their lives and their communities. Adult education programs have proven positive impacts on families and communities, including reducing crime and recidivism rates, high school dropout rates, and life expectancies.

## Fault Lines: Geopolitical Rivalry in the East China Sea

College of Arts and Sciences: History

Poster - Honors Thesis

**PRESENTERS** Nicholas Alexander Dalton

**ADVISORS** Christopher S Agnew

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Senkaku Islands dispute in the East China Sea stands as a major territorial dispute between the People's Republic of China (PRC) and Japan. This dispute has periodically reemerged in the interactions between these two states between 1895, when the Senkaku Islands were definitively administered by Japan, and the present day. The dispute has undergone significant changes in its emphasis by both the PRC and Japan, as well as what the dispute is about. At its early stages, the Senkaku Islands dispute was largely ignored by both China and Japan. Even between 1971 and 1978, when the Senkaku Islands dispute entered its modern form, the dispute was deemphasized to promote normalization of relations between the PRC and Japan. However, after the 1980s, with a rising PRC and somewhat economically and militarily weaker Japan, the dispute emerged with new intensity. In turning to the focus of the Senkaku Islands dispute, this has involved both economic interests, such as the resources in and around the adjacent seabed, as well as elements of popular nationalism. The Senkaku Islands dispute has created significant tensions and military development between Japan and the PRC. This paper examines how the Senkaku Islands dispute has driven militarization between the PRC and Japan.

## Determination of Stock Prices and Interest Rate's Behavioral Movement By Utilizing the Brownian Motion

**College of Arts and Sciences: Mathematics**

Poster - Capstone Project

**PRESENTERS** Matthew Scott Hooper**ADVISORS** Dan Ren**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Below is a look into the Brownian Motion, and how it is able to portray the erratic movement over time of stock prices and interest rates. Further, is a look into how different financial models such as the Ho-Lee Model and Vasicek Model are able to utilize this brownian motion in order to describe the movement of short term interest rates and thus can be used to carry out various financial valuations, such as bond option pricing and evaluating interest rate futures.

**Forecasting Rain Using Logistic Regression****College of Arts and Sciences: Mathematics**

Poster - Independent Research

**PRESENTERS** Alsomali Ibrahim Y Alsomali**ADVISORS** Maher B Qumsiyeh**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Prediction and forecasting using logistic regression have exploded during recent years. Logistic regression modeling now used in almost all kind of knowledge. Rainfall is an important event in the climate system. Whether it rains or not has a big impact on several life areas such as nature, agriculture and animal life. Thus, we need to be able to predict rainfall. In this paper, we show how to use logistic regression for predicting rainfall. Ten years of daily rainfall data used to build the model. Two extra years of observed daily rainfall data used as a validation of the model. Our finding shows that logistic regression model can predict the rainfall very efficiently.

**Runge-Kutta Methods to Explore Numerical Solutions of Reactor Point Kinetic Equations****College of Arts and Sciences: Mathematics**

Poster - Capstone Project

**PRESENTERS** Elizabeth N Boeke**ADVISORS** Muhammad Usman**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This work is the study of Reactor Point Kinetic equations. This is a system of seven coupled ordinary differential equations, one for neutron density and six for delayed neutron precursors. The application of Runge-Kutta methods is used to study the system numerically. Solutions were then compared for different values of reactivity using MATLAB built-in functions ode23 and ode45. There are graphs and tables presented to compare these methods; theoretically ode45 is of higher-order than ode23.

**Interpolation Methods****College of Arts and Sciences: Mathematics**

Poster - Independent Research

**PRESENTERS** Mohamed Khalifa I Aburakhis, Mohammed Mutlaq Almatrafi**ADVISORS** Muhammad Usman**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In this work, the interpolation methods, Polynomial interpolation, Cubic Splines interpolation, Akima cubic spline interpolation, Since function interpolation, and Radial Basis Function interpolation are implemented using MATLAB. The derivation and mathematical equations are presented. Finally, all methods are applied to one example for the sake of comparison. There is not enough literature on the comparison of interpolations methods, this work is an attempt to provide a survey of above methods.

**The Enhancement of Saudi Soft Power Under the Vision 2030****College of Arts and Sciences: Political Science**

Poster - Capstone Project

**PRESENTERS** Amal M Alrasheed**ADVISORS** Jaro M Bilocerkowycz**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Kingdom of Saudi Arabia is undertaking a revolutionary political and socio-economic transformation. Saudi Arabia adopted the vision 2030 program in 2016, and these reforms are receiving a great deal of attention from analysts and international experts, given the scope and depth of the transformation and its impact on the Saudi economy and society. Many scholars have focused on the economic aspects of the vision, but have left out the political and social aspects. This research focuses on how the reforms are going to impact the Saudi Arabia's Soft power? Moreover, the research covers diverse questions about the emergence of the vision, how is it going to be implemented, and what are the domestic and international perspectives on this vision of the future of Saudi Arabia?



## Health Policy Responses and Infrastructure Re-Use in Host Cities of Mega-Sporting Events in Non-Traditional Host Countries

College of Arts and Sciences: Political Science

Poster - Honors Thesis

**PRESENTERS** Andrew M Kramer

**ADVISORS** Joshua D Ambrosius

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Many people and event organizers have lobbied for the allocation of Olympic sites to non-traditional sites by marketing them as a transformational event for the country's economy and infrastructure. We study the efforts of three case studies: the 2016 Summer Olympics in Rio de Janeiro, the 2014 Winter Olympics in Sochi, Russia, and the 2010 World Cup in Johannesburg, South Africa. By inspecting health policy responses and urban infrastructure re-use projects, this thesis research contributes to the understanding of the impact of hosting mega-sporting events for communities in host cities. We specifically connect the impact of hosting a sporting event for the best athletes in the world—often models of health for audiences—has on the health of its community members.

## The Effects of State Anxiety on Olfactory Function in Healthy Young Adults

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Lauren Taylor Olson

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The specificity of the interaction between the olfactory and emotional systems in the human brain remains unclear due to contradictory research findings. Prior studies have found both positive and negative associations between levels of anxiety and odor detection sensitivity, identification ability, and hedonic ratings. To address this lack of conclusive findings, the present study utilized a within- and between-subjects experimental design to investigate the effects of anxiety induction on olfactory threshold, identification accuracy, and hedonic ratings among 40 undergraduate University of Dayton students. The experimental procedure tested several hypotheses regarding changes in measures from baseline to post-induction: Participants in the anxiety induction group will exhibit a significant decrease in post-induction odor threshold scores, compared to baseline scores, while odor threshold scores will remain stable in the control group. Participants in the anxiety induction group will exhibit a significant increase in their post-induction odor identification accuracy scores, compared to baseline scores, while odor identification accuracy will remain stable in the control group. Participants in the anxiety induction group will rate post-induction neutral odors as significantly more unpleasant compared to control ratings. Understanding the specific effects of anxiety on olfactory perception is critical in expanding the understanding of reactive emotional processes and may help future researchers who wish to study anxiety and emotional dysfunction in relation to perceptual processes.

## The Persistence of Neotenus Behaviors in *Felis catus*

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Karina H Palermo

**ADVISORS** Greg C Elvers

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

It is hypothesized that as a cat owner's nurturing behavior increases, the cat's neotenus (juvenile) behaviors will increase. Bradshaw, Casey, and Brown (2012) reports the persistence of juvenile behaviors to be one of the three effects that domestication has on *Felis catus*. Though physiological changes are more easy to observe, behavioral changes are more challenging to measure, as they vary cat-by-cat. Moreover, Price (1999) notes that changes in animal behavior are often due to changes in the animals' social environment. The changes from wild to domestic, or even outdoor to indoor living have a large impact on cat behavior. Locke and Prinz (2002) explain that when it comes to parenting, nurturance can be shown through emotional expressions, such as a hug, and instrumental acts, like playing a game together. Participants' behavior towards their cats are measured using these categories. The topic under question is finding correlates of persistent neotenus behaviors in *Felis catus*. Nurturance questionnaires, neotenus behavior checklists, as well as emotional expressions and instrumental acts checklists adapted for the cat and owner relationship have been distributed to patrons of the Gem City Catfé in Dayton, OH. The café receives a \$1 donation for their partnering cat rescue for each completed packet that is returned. The data will be analyzed using multiple regression to predict neotenus behaviors from nurturance, instrumental acts, and emotional expressions.

## Personality Risk and Protective Factors Moderate Associations of Relationship-Contingent Self-Esteem with Mental Health and Relationship Outcomes

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Frane Francis Santic

**ADVISORS** Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Contingent self-esteem occurs when an individual's self-esteem is affected by a specific outcome or situation. This form of self-esteem can occur within different domains, with one specific domain being relationships. Relationship-Contingent Self-Esteem (RCSE) "involves having one's self-regard hooked on the nature, process, and outcome of one's relationship" (Knee, Canevello, Bush, & Cook, 2008). RCSE is said to occur from a thwarting of basic psychological needs, including competence, relatedness, and autonomy. When these needs are not fulfilled, issues such as feelings of incompetence, a lack of feeling of control, and issues with connecting with other individuals can occur. Further, those high in RCSE can have lower relationship satisfaction and experience higher levels of negative emotion felt. The objective of the study is to examine how certain personality risk and protective factors that are correlates of the basic psychological needs influence the relationship between RCSE and relationship and the experience of negative emotion (i.e., depression). The study draws from a large sample of married alumni from a private Midwestern US university. Participants were asked to complete a survey containing a range of measures for basic psychological needs, relationship satisfaction, depression, RCSE, authenticity, anxious attachment, and self-compassion. The study examines how individuals with RCSE are impacted by attachment style, feelings of self-compassion, and other personality factors, as well as what level of depression and satisfaction they currently feel in their lives. If one's basic psychological needs are being met then it's possible that the negative impact of RCSE on relationship satisfaction and depression could be reduced, or possibly eliminated. Understanding what constructs act as risk or protective factors can inform either the creation of or mending of current interventions that are meant to specifically target these constructs. These interventions could in turn, diminish the negative impact of RCSE.

### **Beyond the Picture: Elaboration more than Description Enhances Memory and Appreciation for Paintings**

College of Arts and Sciences: Psychology  
Poster - Independent Research

**PRESENTERS** Jacob Severino Avendano, Abigail T Flower, Tessa Nicole Jatczak, Brad Charles Wolfred, Yu Zhao

**ADVISORS** Susan T Davis, Mark A Matthews

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Aesthetic preferences involve many factors that determine how people respond to art. For example, the context surrounding photographic art (e.g., titles) influence its aesthetic appeal (Millis, 2001). The present study examines the effect of titles on aesthetic preferences for paintings. We hypothesize that (a) participants will show greater preference for paintings with elaborative titles compared to descriptive titles, and (b) participants will have better memory for paintings with elaborative titles compared to descriptive titles. Participants evaluated images of lesser-known Van Gogh paintings. Prior to the experiment, a sample of students was presented with these paintings along with elaborative and descriptive titles to verify that the titles were valid. In the experiment, all participants were exposed first to paintings without titles. Next, participants were exposed to the same paintings in a randomized order with titles. Titles were either elaborative (evoking a deeper thought process, such as "Water Sustains Life" for a painting of a bridge over a stream) or descriptive (naming objects in the painting, such as "Bridge over Water" for the same painting). Participants were asked questions assessing preferences: if they liked the painting, if they would buy the painting, and if they would hang the painting in their home. A control group also assessed the paintings twice, but without the titles present either time. All participants then completed tasks unrelated to the experiment to distract them from reviewing the paintings. Finally, participants viewed the original paintings intermingled with new Van Gogh paintings to test their memory for the original paintings. Preliminary results show that participants prefer and recall more of the paintings with elaborative titles compared to descriptive or no titles. These results support our hypotheses, suggesting that elaboration enhances one's experience when viewing paintings, and elaboration also make the paintings more memorable.

### **Sleeping on it: Examining the Effects of Sleep Consolidation when Encoding is Interrupted**

College of Arts and Sciences: Psychology  
Poster - Independent Research

**PRESENTERS** Taylor Nicole Chambers, Alexander N Lawriw, Gabby Louise Silone

**ADVISORS** Susan T Davis

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Research indicates that memories are strengthened by consolidation, defined as their incorporation during sleep into a previously established memory network (Rasch & Born, 2008; Rasch & Born, 2013). Data indicate that memories are initially unstable after encoding and that sleep consolidation increases resistance to interference (Robertson, 2011). On the first day of a two-day experiment designed to examine whether interrupting the encoding of a memory would affect later memory consolidation, participants in the present research memorized pictures of common objects (e.g., owl, motorcycle) presented in a slideshow. At the midpoint of the slideshow, there was a simulated computer crash. While the experimenter pretended to amend the fake situation, participants completed an unrelated task to prevent rehearsal of the pictures. Shortly after, the slideshow resumed, presenting the remaining pictures. Participants were assigned to either complete an immediate recognition test of the pictures, return to lab the following day to complete a delayed recognition test, or complete both an immediate and a delayed recognition test. We tested three hypotheses; first, pictures that appeared near the beginning and the end of encoding, and those that appeared after the resumption of the interrupted slideshow would be better remembered than those pictures that appeared just before the interruption, due to primacy and recency memory effects. Second, pictures tested for memory only on the second day would be remembered better, due to sleep consolidation, than when tested for memory only on the first day. Third, participants tested on the first and second day would

be more confident in their memory of the pictures, and, due to sleep consolidation and repetition, would recognize more pictures on the second than on the first day of testing.

## The mediating role of idealization in the association between couples' geographical separation and infidelity

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Ellen Frances Krueger, Angel Luis, Emily Nicole Panella, Hind Salih, Alicia Michelle Selvey, Gabriella M Vargas

**ADVISORS** Lee J Dixon

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Although romantic partners are typically characterized as being closer in proximity, long-distance relationships (LDR) are becoming more common. LDRs are more common for various reasons, including educational degree attainment, military deployment, and emigration. Couples use Relational Maintenance Behaviors to continue and enhance the relationship. One such behavior is categorized as idealization, which occurs when a partner focuses on the positive aspects of the relationship and ignores disagreements or areas of contention. LDR couples have a tendency to idealize each other more due to geographical distance and lack of proximity. Previous research suggest that maintenance behaviors negatively correlate with infidelity; it is possible that LDR couples who engage in maintenance behaviors are less likely to cheat on their partners. There are many facets to emotional infidelity, such as sexuality, emotional satisfaction, attitudes-norms, and revenge-hostility. The relationship between maintenance behaviors and idealization has been documented by previous research, but infidelity in relation to both has yet to be explored. Based on previous research, we hypothesize that idealization will mediate the relationship between geographic proximity and infidelity. Specifically, we predict that those who are in long-distance relationships will idealize their partners more than those who are in geographically close relationships, and that higher levels of idealization will, in turn, predict lower levels of infidelity. Mediation will be tested using a bootstrapping technique. Results will be presented.

## An Exploration of Children's Executive Functioning and Maternal Emotion Regulation Skills: A Proposed Study

College of Arts and Sciences: Psychology

Poster - Graduate Research

**PRESENTERS** Kirsten Lee Anderson

**ADVISORS** Mary Fuhs

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Executive functioning (EF) skills, that is, skills involved in planning and problem solving, are imperative for children's school readiness. According to a nationally representative survey of kindergarten teachers, EF skills are more important for success in kindergarten than purely "academic" skills such as knowing how to count to twenty, recite the alphabet, or recognize colors and shapes (Heaviside & Farris, 1993). Therefore, it is important to understand which factors relate to children's early development of EF skills, especially for children growing up in poverty who are at risk for academic difficulties. Some research has suggested that there is intergenerational transmission of EF skills, specifically linking maternal EF and child EF, but this association has been limited to EF tasks measuring "cool" EF skills or those not involving emotion regulation (Kim, Shimomaeda, Giulano, & Skowron, 2018). The purpose of the proposed study is to examine if mothers' self-reported "hot" EF, or emotion regulation skills, are significantly correlated with their child's performance on their everyday EF skills behavior in both "cool" and "hot" EF skills domains. This study will examine data from 42 mother-child dyads enrolled in a parent education program across sites located in two high-poverty neighborhoods. At the time of enrollment, parents completed a self-report questionnaire of emotional regulation (Wong & Law, 2002) and reported on their child's "hot" and "cool" EF skills as assessed by the Childhood Executive Functioning Inventory for Parents and Teachers (CHEXI; Thorell & Nyberg, 2008). Aggregate scores will be calculated for parent emotion regulation and the CHEXI for "hot" and "cool" items, and simple linear regression will be utilized to examine if there is a significant association between mothers' reported emotion regulation skills and their children's EF skills, controlling for covariates.

## Depression, Suicidality, and Sleep Disturbances: A Literature Review

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Karla Leigh Borgerding

**ADVISORS** Julie Walsh Messinger

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Past research has shown that it is common for people with depression to report sleep disturbances. However, the relationship between sleep disturbances and suicide is not as well known. The current literature review looks at several articles relating to depression, suicidality, and sleep disturbances. Specifically, how sleep disturbances increase mood dysregulation which may lead to an increased amount of suicidal thoughts (Cukrowicz et al., 2006). Specific types of dreams (e.g. a nightmare) seem to be a prominent symptom of sleep disturbance that may result in greater mood dysregulation, and consequently, more severe and frequent suicidal ideation (A?arg?n et al, 1998). In one study, women tended to report more frequent nightmares than men and were more likely to report suicidal ideation (A?arg?n et al, 1998). From these articles, it is concluded that sleep disturbances are a possible risk factor

for suicide among depressed populations. This could imply that therapists should incorporate sleep monitoring into their treatments for depressed and suicidal patients.

## **Differences in the Development of Internalizing and Externalizing Behaviors in Children of Depressed Mothers**

College of Arts and Sciences: Psychology

Poster - Honors Thesis

**PRESENTERS** Hannah Simone Jackson

**ADVISORS** Jackson A Goodnight

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This research project explores variables that may impact the outcomes of children with clinically-depressed mothers, with a focus on 14- to 17-year-old adolescents. We are interested in learning why some children with depressed mothers develop anxious thoughts or behaviors while others develop aggressive thoughts or behaviors. To do so, we are analyzing relevant variables that have potential to impact or explain the differences in development, such as relational separation and family instability, mother/child relationship, and parenting practices. Statistical analyses have demonstrated that some of these variables of interest are significant mediators between maternal depression and specific child outcomes, but not all of them. This project also uses sibling- and cousin-comparison models in order to ensure that genetics are similar and that environmental factors are the main focus. This research is important as it will give insight on what may be affecting the mental health of adolescents and teenagers, hopefully leading to better education for families and beneficial resources that allow children in these circumstances to thrive.

## **Examining the Stability of the Purrsonality of *Felis catus*, the Domestic House Cat**

College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Taylor Nicole Chambers, Alexander N Lawriw

**ADVISORS** Greg C Elvers

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

People have a tendency to believe that their beloved furry felines have their own unique personalities. However, according to the traditional definition of personality, a set of characteristics that are stable across both time and different circumstances, this may not entirely be true. Previous research into this area has resulted in dimensional groupings of cat personality traits similar to those found within the well-known human equivalent, the Big Five (Feaver, Mendl & Bateson, 1986; Karsh & Turner, 1988; Bennett, Rutter, Woodhead & Howell, 2017; Ha & Ha, 2017). While the number of labels and dimensions discovered typically differs, these studies have all come to the conclusion that cat personality traits do exist, and that they vary from individual to individual. Yet, none of these studies have intentionally examined the stability of these traits, a key component of overall personality. The current study addresses this issue by asking primary caregivers of cats to rate, on a scale from one to five, how well 29 adjectives (taken from Bennett et al, 2017) describe their cat in three different situations and at two periods of time. The 29 adjectives rated by the participants were scored on the six dimensions of cat personality (playfulness, nervousness, amiability, dominance, demandingness, and gullibility) following the method of Bennett et al. (2017). Separate repeated measure ANOVAs were conducted with either situation or time as the independent variable. A Bonferroni adjusted  $\alpha$  level of  $.05 / 6 = .00833$  was used. Significant effects of situation were found for playfulness, nervousness, amiability, dominance and demandingness. Gullibility was not statistically significant. Significant effects of time were found for amiability, dominance, and demandingness. Playfulness, nervousness, and gullibility were not statistically significant at the Bonferroni corrected  $\alpha$  level. In conclusion, while certain personality traits were found to be stable either across time or across situations, others were not; therefore, overall personality was not stable.

## **The Role of High-Quality Preschool Experiences in School Readiness Skills Gains**

College of Arts and Sciences: Psychology

Poster - Course Project, 201810 PSY 493 28

**PRESENTERS** Maddy Leigh Weimer

**ADVISORS** Mary Fuhs

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Recent research suggests that young children from low-income homes benefit most from participating in high-quality early childhood environments (Geoffroy et al., 2010). It has been further suggested that a high-quality preschool experience can mitigate the link between poverty and difficulties with school readiness (Ladd, 2017). In order to investigate this further, we will test the effects of interactions between classroom quality and maternal education levels and family income on children's school readiness skills in a comprehensive battery of assessments, including assessments of self-regulation skills, academic skills in math and literacy, and social and emotional skills. We predict that children living in homes with parents with lower educational levels and lower income will benefit the most in their school readiness skills gains across the preschool year if they attend preschool at a high-quality early childhood classroom.

## **Asking the right questions: An indirect strategy for improving lie detection**

## College of Arts and Sciences: Psychology

Poster - Independent Research

**PRESENTERS** Elliot Duke Buccieri, Adriana Francesca Degenova, Lauren E Murphy, Margaret Frances Weingarz, Scott Anthony Wonderly

**ADVISORS** Susan T Davis, Mark A Matthews

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Despite our ability, innate and learned, to perform many tasks, we are, on average, only 54% accurate at detecting lies; this rate of performance is only marginally better than a lucky guess (Bond & DePaulo, 2006). However, research by ten Brinke et al. (2016) suggests that people may be able to detect deception indirectly. Our team, used suggestions of future research from ten Brinke et al. (2016) to study indirect detection of deception by participants watching the video interview of a person suspected of lying. The first hypothesis for this research was that better deception detection would result from questions that primed implicit associations of dishonesty from an observer than from direct questioning of the observer about the dishonesty of a person in a video. A second hypothesis was that the type of question asked of an observer would produce more correct identifications of dishonesty when the questions (a) evoked biases about the person in the video (e.g., stereotypes that individuals in some professions are more or less honest than others), (b) expectations of behavior of the person in the video (e.g., would the person in the video cheat), and (c) probed about nonverbal characteristics indicating the dishonesty of the person in the video (e.g., fidgeting and looking around instead of at the interviewer). A control group of observers was directly questioned about whether the person in the video was lying. Data collection is in progress and our expectation is that indirect questioning will lead to more accurate deception detection than will direct questioning. We also expect that of the three types of indirect questions, those that evoke biases and expected behaviors will produce better deception detection than will questions about the personal characteristics of the person in the video.

## Economic Restructuring in Dayton

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** William David Rice

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Dayton Ohio use to be a huge and growing blue-collar community. In the past 30 years, several large factories have moved away, leaving former employees struggling to find new jobs. Drawing on Facing Project Narratives in Dayton and social science literature, this project will examine the causes and effects of economic restructuring that occurred between 1980 and the 2000s. In addition, this poster will provide an overview of efforts to overcome the unintended consequences of economic restructuring in Dayton.

## Police Brutality in the Dayton Community

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Shelby S Goble

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Police brutality can be defined as the use of excessive or unnecessary force by police when dealing with civilians. It has been in issue in the Dayton community for years and with the recent shift in focus in the media, this problem has received more attention locally, as well as nationally. This topic brings to light issues within the criminal justice system as well as community issues, such as racism, poverty, and other social inequalities. The goal of this poster presentation is to highlight the community level issues that perpetuate criminal behavior and encourage police brutality. Drawing on social inequality literature and Facing Project Narratives from Dayton, this poster will discuss concentrated poverty and racism and their role in promoting criminal behavior. The presentation will also cover possible solutions to the issue of police brutality such as more community involvement from younger generations or more attention from the city. A problem as serious as police brutality deserves more attention, action and change.

## Institutional Racism in Dayton

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Kenni Jean Graham

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Institutional racism refers to institutional beliefs or vocabulary that denigrates minority racial groups and that perpetuates systematic racial inequalities in society. This project examines forms and consequences of institutional racism in the history of Dayton. Drawing on Facing Project Narratives along with social inequality literature, this poster will identify historical forms of institutional racism that reflect and produce racial inequality in society today. In addition, this poster will discuss how social change has occurred around institutional racism and provide community-level recommendations to help ameliorate the persistent repercussions of these policies on the city of Dayton.

## **History of White Flight in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Emma Nicole Bohaboy

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This presentation will examine the causes and consequences of white flight in Dayton during and following the Civil Rights Era. Drawing on Facing Project Narratives from residents of the Dayton area and social science literature, this poster will highlight the history of the white flight movement in Dayton, Ohio. The poster will help viewers understand the effects of white flight and other forms of discrimination and segregation on the city of Dayton at the time the events were taking place (throughout the 1900's) and the issues that remain today. I will present information on the social impact of white flight and discriminatory practices on the Dayton community and will explain some of the ways that the city is attempting to address these problems.

## **Struggles in Single Parent Households**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** James Gerald Hatstrup

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Single parent households in the Dayton area face greater hardships than families that consist of two parents. Research suggests that single parent families are presented with bigger problems, such as financial constraints and lower educational achievement among their children. Drawing on Facing Project Narratives and social science literature, this poster will highlight how single parent families face more challenges providing for their children and themselves. The subsequent challenges children of these families face will also be discussed. Finally, I will identify current programs designed to assist single parents as well as how other programs might also be effective.

## **Dayton and the Opioid Epidemic: A Tragedy in the Making**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Courtney Rose Kemna

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Dayton has one of the highest drug overdose rates in the United States. This opioid epidemic can be linked to a number of broader socioeconomic challenges facing the area, including unemployment, the decline of manufacturing, and location. This poster will highlight information on this epidemic and its causes in the Dayton area. To do this, I will draw on social science concepts and theory as well as informal interviews with professionals who are engaged in the epidemic. In addition, I will provide an overview of current efforts in Dayton to address this issue (e.g. Community Overdose Action Team, Miracle Makers, and East End Community Services) and argue that long term solutions will require addressing the root causes of the epidemic.

## **Open Minds to Open Doors: How Dayton is Becoming More Inclusive**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Haley Marie Sandifer

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The city of Dayton, OH is a small-scale example of a problem facing our nation: the lack of understanding between different groups of people living in the same area, leading to a sense of separation and often exclusion. Frequently ostracized groups include immigrants or minorities and people living in impoverished conditions or in low-income areas. I will use class literature, historical documents, excerpts from the Facing Project Narratives in Dayton, and direct communication with community members to show the negative effects of these harsh divides between groups in Dayton. The goal of my poster is to increase awareness about this issue and to show that strides are being taken in our city to break down these barriers, foster unity, and enact social change. Programs such as The Longest Table, Welcome Dayton, and Peace Dayton will be discussed.

## **Social Change in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Sarah A Critchfield

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Volunteer programs that help people residing in low-income communities get involved with the rehabilitation of their neighborhoods can be a valuable tool in facilitating social change. The Mission of Mary Farms co-op demonstrates how social change can occur through community engagement and open discussion. Mission of Mary Farms provides experiential learning, fresh produce, and volunteering opportunities. This presentation will explore how communal involvement and conversations about the future can lead to the restoration of Dayton. I will examine how Mission of Mary navigates the line between rebuilding a community and gentrifying it. I will also investigate how this co-op has affected its community and if it can expand to reach more of the Dayton area.

## Community Shift Towards Individualism

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Hannah Katherine Donovan

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Public Social Capital is the network of relationships of people that a person knows and the resources they provide for them; as defined by McNamee (2014), "the social capital grapevine is only available in and through relationships and the groups which these relationships occur," (79). The resource base for higher socioeconomic groups is far wider and deeper than that of those lower socioeconomic origins which creates a gap in information and influence between economic groups. Drawing on social inequality literature and the Facing Project Narratives related to public social capital, this poster will discuss the impact of changing neighborhoods and public social capital in the Dayton area. Understanding how social capital functions to either aid or limit in number of opportunities, resources, and connections in society. Currently and looking into the future, I hope to examine the resources available to connect people and grow in their associational life.

## Social Inequality is not Healthy

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Heather Christine Essman

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Social inequality has led to poor health in people experiencing poverty. People facing social marginalization and isolation lack access to the same health care as those who are wealthier. Drawing on Facing Project narratives and social science literature, this poster will provide an analysis of the impact of social inequality on health. It will discuss the history, causes, and elements of social change that the future may hold. Finally, social insurance and public assistance programs such as Medicare and Medicaid will be discussed as well as their relevance to addressing such health disparities.

## Complications of Housing Arrangements in Dayton

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Dylan Anthony Penna-Powell

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

American homeowners accumulate material wealth as they gain equity on their homes. A sociological look at how people are distributed around the city of Dayton according to their socioeconomic backgrounds reveals more than geographical details of social and economic inequality. This presentation explores the effects that disparities in housing arrangements have on closely related areas of interest such as education, access to affordable and nutritious foods, and individuals' likelihood of economic mobility. In addition, opportunities for reform through public education funding via local property tax dollars will be discussed. Reformation of a system in which the value of one's home is tightly linked to the quality of nearby public schools would provide greater opportunity for social and economic mobility to those in low-income communities.

## The Impacts of White Flight in Urban Neighborhoods of Dayton

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Aaron Joseph Pirc

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The challenges that face Dayton's public schools are the product of a number of historical events, including segregation, block busting, and white flight. Drawing on the Facing Project Narratives, news articles from the city of Dayton, and social science literature,

I describe these challenges. This poster presentation raises awareness on the issues students face. In addition, programs that have attempted to improve educational outcomes in Dayton (such as Dayton Early College Academy) will be discussed.

### **Dayton and the Great Recession**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Nick Steven Lafrance

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Today, the city of Dayton, Ohio is still currently experiencing the side effects of the housing plummet in 2008, also known as the Great Recession. This poster will examine how, what, and why the Great Recession of 2008 happened. Meanwhile, keeping in mind that this is not the first time our country has experienced an economic fall. Drawing on social inequality literature, Facing Project Narratives, and national and local data, this poster will follow the effects the Great Recession has had on our local economy and more specifically the city of Dayton.

### **Poverty and Inequality in Dayton and the Surrounding Areas**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Eric Wallace Handorf

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Today, there are severe disparities in economic well-being between the city of Dayton and the surrounding areas. This project examines the historical causes and current consequences of severe economic inequality in Dayton and its surrounding areas, as well as how social change has occurred around this topic. To do this, I draw on the Facing Project Narratives, social inequality literature, historical documents, and current work being done to help the problem. The project will conclude with recommendations as well as an overview of current efforts that specifically address poverty and inequality.

### **Feeding the City: Food Access and Grocery Stores**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Tiffany Erin Hendricks

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Several areas of Dayton are considered "food deserts," meaning that fresh fruit and vegetables, along with other healthful whole foods, are largely unavailable in these areas. Drawing on Facing Project Narratives in Dayton as well as social science literature, the purpose of this research poster is to investigate food access in the City of Dayton. More specifically, this poster will highlight the causes, conditions, and effects of food deserts and how the presence of a food desert can be representative of the inequalities present in Dayton citizens' lives. Additionally, connection between poverty and food access is discussed as well as current and potential efforts to combat this issue such as the Urban Renewal Farm, government-subsidized grocery stores, food cooperatives, and increasing the size and resources available for urban growing.

### **Redlining: Lasting Scars in the City of Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Jillian Marie Malone

**ADVISORS** Danielle C Rhubarb

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Redlining, a practice of systematic discrimination against African Americans in the distribution of home loans, left scars on the city of Dayton that can still be seen in housing patterns today. These patterns have a ripple effect not only on housing, but also on issues such as inequality in education and wealth. Utilizing narratives from the Facing Project, historical maps, and sociological literature, this poster seeks to shed light on the effects of redlining in Dayton by providing a historical context and theoretical framework. This poster will also explore current efforts in the city that aim to address and ameliorate the lingering effects of redlining.

### **Race Represents Nothing and Everything**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Faith Ann Senkbeil

**ADVISORS** Danielle C Rhubarb



**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

While many of the institutionally racist practices in American history have been eliminated, other forms of racism persist. For example, personal racism occurs when individuals or social groups, governed by behavioral norms, support racist thinking and increase active racism. This type of racism affects an individual's ability for social mobility as well as their equality in schools, neighborhoods and society as a whole. Drawing on examples of personal racism from social science literature and the narratives of the Facing Project in Dayton, I will show how personal racism limits social mobility as well as how acts of resistance are used to overcome it. While addressing institutional racism is a first step to creating a more equal society, addressing personal racism must also be part of the solution.

### **The Roads that Divide: Examining the effects of road systems in Dayton**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Nathaniel L Quam

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The highway system of Dayton was meant to facilitate higher productivity and movement of people. The highway system of I-75, 35, I-70 and the other lesser major highways in the area did make for faster travel, but this had unintended consequences. They came in the form of the white flight movement and the creation of suburban areas around Dayton. Drawing on Facing Projects Narratives, I will use this presentation to highlight the demographic and socioeconomic shifts in Dayton neighborhoods that led to the mass exodus of capital and amenities in these areas. This poster explains why this change occurred, the consequences of those changes, as well as potential changes that could occur to desegregate the population from wealthy suburban and poorer urban populations.

### **Teen Pregnancy: An ongoing trending the Dayton area**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Sami Marie Rossiter

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Teenage pregnancy can lead to a number of negative consequences related to child health and well-being. Teenage pregnancy in the Dayton area is a continuing issue from year to year. It is just one effect of social inequality that stems from people living in poverty with limited access to adequate education and opportunities. The goal of my poster is to identify the past and current trends of teenage pregnancy in Dayton, as well as give sight to what could be done in the future to improve what needs to be adjusted. There are multiple approaches that I will explore that could be used to ameliorate teenage pregnancy. To start, we must fully understand the extent of the issue and what the root causes of teenage pregnancy are.

### **Challenging the American Dream in Dayton, OH**

College of Arts and Sciences: Sociology, Anthropology, and Social Work

Poster - Course Project, 201810 SOC 339 01

**PRESENTERS** Abby Anne Pech

**ADVISORS** Danielle C Rhubart

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The ideology of the American Dream has a negative impact on those who are low income by creating a false perception of what it takes for residents to reach their full potential. The American Dream emphasizes that everyone has the freedom and ability to succeed, economically and socially, through hard work and dedication, but fails to address the underlying barriers that stand in the way of this achievement. Drawing on narratives from the Facing Project in Dayton and social science literature, it is clear that non-merit factors such as social capital, cultural capital, and inheritance hinder the poor from achieving the American Dream. The goal of this poster is to highlight the historical impact of the American Dream on people in the Dayton area and emphasize how the upper class has an unfair advantage over the lower class. It will delve into the functional and conflict explanations of poverty and examine the issues surrounding the four ingredients needed to obtain the American Dream, which include talent, the right attitude, hard work, and moral character. In order to level the playing field in the Dayton area, I recommend a number of measures that could begin to foster equal opportunity to the American Dream.

### **Evaluation of a School-Based Tier Two Anxiety Intervention: The Worry Box Technique**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Katrina Olimpia Aguenza Lazarte

**ADVISORS** Elana Renee Bernstein

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

School practitioners frequently learn about intervention strategies on websites, blogs, and social media, yet these strategies often lack empirical support. One such technique, the worry box, is a cognitive-behavioral strategy that may be implemented as a Tier 2 intervention for students with anxiety. This poster presentation will share the results of a study that examined the effectiveness and feasibility of the worry box technique for children with anxiety in a school setting.

## **The History of Physical Education-Activity, Sport, and Related Disciplines: Stories for the Ages and Lessons from the Legends of Memorable Moments, Events, Trends, Tales, Phenomena, and Famous Women and Men: Their Teams and Times - From the Marianists to the Moderns: Year 12**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 275 01

**PRESENTERS** Abdulla Jasem Hasan Alhosani, Alexa Christine Amato, Tanner Rea Ayers, Samantha Lynn Bagdasarian, Marisa Miceli Banke, Ryan James Barnes, Mary Elizabeth Bayer, Aidan Bean, Christi Michelle Begeman, Austin Bergman, John Brown, John Thomas Brown, Kailee Ann Budicin, Mark D Bugada, Zachary John Burneka, Austin Waide Cline, Trina A Coleman, Isabelle M Connolly, Melanie Hope Craft, Julianna Lillian Curry, Audrey Lynn Eisenmann, Kelly Ann Evers, Kelly A Fitzgerald, Nolan Joseph Francis, Monica E Friedl, Lenny Michael Froehlich, Kate S Galfano, Lance Paul Gaspar, Megan Elizabeth Gerrity, Adam Joseph Goettemoeller, Troy Grabowski, Megan Irene Grace, Matt Mark Groeber, Kayla P Haberstick, Tate Joseph Hagan, Connor Anthony Hanson, Bauer Daniel Harris, Max Anderson Hawthorne, Nathan Thomas Helfferich, Kylie Renae Huesman, Brantley B Johnson, Quin George Kane, Mattea Kilstofte, Benjamin Klocke, Jessica Marie Koverman, Henry A Kuechly, Shane William Lefever, Justin T Longbrake, Reilly Alexandra Madsen, Keegan Michael McCafferty, Samantha Marie McDermott, Kevin Patrick McNamara, Alex George Medich, Jack Francis Monahan, Brandon Paul Moore, Josh Jacob Nixon, Tyler P Obear, Kayla Pariser, Lydia Christine Payton, Jamie Lynn Peterson, Tiaera Phillips, Sierra Bianca Pla, Sara Emily Robertson, Trent D Rothert, Alexandra A Rubin, Danielle Marie Ruffolo, Benjamin Nicholas Schmeusser, Brandon Michael Smith, Kelly Marie Sonnefeld, Christine E Szabo, Jake Edward Thomas, Alec N Trautman, Michael Joseph Turner, Samuel Tutu, Lauren Nicole Van Oss, Kyle Vassilo, Robert Joseph Wagner, Diandra A Walker, Jack Christopher Walsh, Marie Theresa Weckesser, Ellison Wenzinger, Tre Alexander Whittaker, Meghan E Wilke, Connor Redmon Wilson, Takahiro Yamada

**ADVISORS** George M DeMarco

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The purpose of these studies was to describe/interpret major events, trends, phenomena, and the lives and times of significant individuals in the history of sport and physical education-activity throughout the millennia. Interesting, inspirational, edifying, and enlightening, the stories told by the Teaching Assistants (N=11) and students (N= 60) of two (2) separate sections of the course HSS 275 - History of Physical Education/Activity and Sport – during the spring semester of 2018 speak powerfully to the transcendent nature of sport and physical activity across all generations, cultures, and topical interests. This year's project titles include: 1.The History of the Department of Health-Physical Education-Sport Science at UD: 1850-20182.John F. Kennedy's Influence on Physical Fitness and Sport: 1960-19633.The History of Women's Baseball4.The Life and Times of Rick Ankiel: A Comeback Story5.The Life and Times of Jim Spoerl: A Flyer ForeverThese original research projects utilized an array of primary and secondary sources, including interviews, personal narrative, documents, print media, photographs, artifacts, and vintage video to bring alive the past to teach anew life's lessons from the worlds of sport and physical activity to inform, inspire, enlighten, and edify attendees of the 2018 Stander Symposium.

## **The Effectiveness of a Personalized Peer Health Physical Education Program (PPHPEP) on the Health Related Physical Fitness, Diet, and Attitudes Toward Wellness of Students Enrolled In A University Personal-Community Health Course**

School of Education and Health Sciences: Health and Sport Science

Poster - Course Project, 201810 HSS 117 01

**PRESENTERS** Christi Michelle Begeman, Zachary John Burneka, Lenny Michael Froehlich, Megan Elizabeth Gerrity, Troy Grabowski, Megan Irene Grace, Reilly Alexandra Madsen, Kevin Patrick McNamara, Alex George Medich, Michael Joseph Turner, Samuel Tutu, Ellison Wenzinger, Tre Alexander Whittaker

**ADVISORS** George M DeMarco

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The purpose of this major course research project was to determine the effectiveness of a Personalized Peer Health Physical Education Program (PPHPEP) on the cardiovascular endurance, muscular strength/endurance, flexibility, diet, and attitudes toward wellness of students enrolled in a university personal and community health course (N=11). In the spirit of pioneering exercise physiologist and researcher T.K. Cureton, who believed that the "true laboratories in physical education [were] the pools, playfields, gymnasiums . . .," this study was field based and conducted primarily at the University of Dayton RecPlex. During the 2018 spring semester, students in one section of an undergraduate Personal Community Health course offered in the Department of Health and Sport Science exercised w/peers during 5 separate sessions. Team members participated in five (5) sessions conducted during class time and five (5) sessions conducted outside of class. Two of the (2) sessions included pre- and post-testing. All in exercise and testing sessions were conducted at the University's RecPlex. Data from Pre and Post Test Fitness Testing Sessions were analyzed and compared using descriptive statistics. Qualitative data from students' weekly Health Wellness Review Reflections (HWRR) were

analyzed and compared to Insell-Roth (2016) Dimensions of Wellness Theoretical Framework to determine the effectiveness of the PPHPEP. Note: Data analysis for the PPHPEP is a Work in Progress (WIP)

## Youth Sport Concussion Management

School of Education and Health Sciences: Health and Sport Science

Poster - Independent Research

**PRESENTERS** Dell James Stover

**ADVISORS** Corinne M Daprano

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Concussions have become one of the most talked about health concerns at all levels of sport in the past several years. While much of the attention on this issue has been directed at the sport of football and the National Football League (NFL) in particular there has been growing awareness in the sport community that the risks of concussions extend to head injuries in all sports. Yet, in a report compiled by the Institute of Medicine (IOM) and National Research Council (NRC) of the National Academies on concussions in youth sports, researchers argued that "...much remains unknown about the extent of concussions in youth; how to diagnose, manage, and prevent concussions; and the short- and long-term consequences of concussions as well as repetitive head impacts that do not result in concussion symptoms" (IOM Brief, 2013). Overall there has been an increase in the number of reported youth sport concussions over the last decade. "From 2001 to 2012, the rate of ED [emergency department] visits for sports and recreation-related injuries with a diagnosis of concussion or TBI [traumatic brain injury], alone or in combination with other injuries, more than doubled among children (age 19 or younger)" (Centers for Disease Control and Prevention, 2017). Some researchers surmise that this increase in concussion reporting may be the result of more education and greater awareness of the symptoms of concussion on the part of athletic trainers, athletes, parents, coaches and athletic administrators. The purpose/objectives of this study are: 1) to examine parent's knowledge and attitudes toward youth sport concussions; 2) to examine youth sport coaches knowledge and attitudes toward youth sport concussions; 3) to compare and contrast the knowledge and attitudes of parents and youth soccer coaches; and, 4) to provide recommendations regarding parental and youth sport concussion management education.

## The Effects of Oral Rehydration Solutions (Sports Drinks) on Strength, Speed, and Endurance - A Field Study

School of Education and Health Sciences: Health and Sport Science

Poster - Honors Thesis

**PRESENTERS** Andrea Lynn Wisniewski

**ADVISORS** Jon K Linderman

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project will study the effects of orally consumed sports drinks on physical performance on field-based tests. Dehydration happens quickly during intense exercise in hot, humid environments. Mild dehydration, noticed by a 2% drop in body weight, can cause a decrease in performance. Intense dehydration, a 10% drop in body weight, causes death. Because athletes and military personnel experience dehydration on a regular basis, having a better understanding of the best sports drinks will lead to better rehydrating programs and potentially save lives. Most sports drinks contain carbohydrates and ions to refuel the body after it burns through its endogenous stores. Gatorade, the most popular commercially available drink, is mostly table sugar, salt, and potassium. This study will into how if CeraSport can prevent dehydration better than Gatorade. CeraSport is not commercially available and uses rice-sugar instead of table sugar. By putting athletic, college-aged men through a series of field tests over three consecutive weekends and feeding them just an ion drink with no sugar, Gatorade, and CeraSport, will help demonstrate if there is a difference in performance. After a 12-hour fast, all participants will be given a standardized breakfast then will run for 90 minutes will a 40-pound pack, do sets of push-ups, a 40-yard dash, vertical leap and finally, run a mile. During this, weight, and urine output will be measured. Each week-end the participants will be given a different drink and who receives what will be randomized throughout the trials. To make sure all participants are fit enough to complete the protocol, they will be pre-screened with a body-fat percentage measured and endurance test.

## Development of an Evidence-Based Strength Training Program for Individuals with Dementia Participating in Adult Day Services

School of Education and Health Sciences: Physical Therapy

Poster - Honors Thesis

**PRESENTERS** Jaclyn Helen Franz

**ADVISORS** Kurt J Jackson

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Falling and loss of mobility present serious risks for elderly adults, especially those with cognitive impairments such as dementia. These risks are shown to be significantly reduced when elderly adults participate in exercises focusing on strength and balance of sufficient intensity. Despite these potential benefits, many adult day programs do not incorporate exercise in a systematic and progressive fashion to achieve desirable improvements in function. The purpose of this project was to develop an evidence-based exercise program, later titled Simply Strong, for reducing fall risk and improving mobility in elderly adults with dementia participating in Goodwill Easter Seals adult day services. An extensive literature review of current research into the implementation and resulting

outcomes of exercise for older adults with dementia was conducted. A supplementary survey of Goodwill Easter Seals program managers regarding barriers and needs was conducted. Barriers to providing such a program were identified through the survey and addressed in the creation of the program so that this program, Simply Strong, and other programs of a similar nature, have an increased likelihood of being utilized long-term. Based on the current literature, an evidence-based training program, titled Simply Strong, was developed to meet the needs of older adults with dementia and through the results of the staff survey was specifically tailored for individuals with dementia at Goodwill Easter Seals Adult Day Service. Staff members of Goodwill Easter Seals were instructed in providing the program so that the program remained self-sustaining after the conclusion of this project. Additionally, a training manual, an accompanying video, and an equipment cart to assist in the implementation of the program was fabricated and then donated to two Goodwill Easter Seals locations.

### **Characterization of Zinc-Histidine Interactions in Nvjp-1**

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Brittanie M Rooths

**ADVISORS** Rajiv Berry, Kristen Krupa Comfort

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The mandible of *Nereis virens*, a marine sandworm, is mostly organic with stiffness and hardness comparable to that of human dentin. Nvjp-1 is the primary protein in the *Nereis* jaw and is inherently Histidine rich. Histidine contributes to the stability of the protein structure and superior mechanical properties through metal-coordinate bonds. Crosslinking of purified recombinant Nvjp-1 creates a water stable hydrogel that is capable of expanding and contracting upon exposure to various ions. Nvjp-1 hydrogels exhibit sclerotization through metal-coordination with divalent cations. Over ninety percent of the amino acid sequence of the carboxy-terminal of Nvjp-1 is comprised of only four amino acids. In order to determine the genetic/protein motifs directly responsible for the mechanical response, a carboxy-terminal truncation mutant of Nvjp-1 was recombinantly expressed and crosslinked to form hydrogels. Dynamic mechanical analysis was performed on the carboxy-terminal truncation mutant to compare its mechanical properties to that of the full-length protein. De Novo structure prediction was performed using Molecular Dynamics simulations as a technique for determining native protein structures. The role of Zn-Histidine interactions in Nvjp-1 and their effect on protein structure was also investigated.

### **Initial Study of Novel Flame Retardants For Epoxy Resin Systems**

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Abdulhamid Ali Bin Sulayman

**ADVISORS** Vladimir A Benin, Donald A Klosterman, Alexander B Morgan

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This poster describes the initial investigation of the reaction between a novel flame retardant (FR) and epoxy resin. The novel chemical (synthesized and provided by UD Chemistry Department faculty) is a phosphorus-based flame retardant that also incorporates primary and/or secondary amine functional groups. These groups potentially could react with epoxy resins, which would then incorporate this FR chemical directly into the polymer network through covalent bonding. This would be a way of introducing flame retardants into epoxy resins to improve flammability of composites. Initial research was conducted using Differential Scanning Calorimetry (DSC), Thermogravimetric Analysis (TGA), and Fourier Transform Infrared Spectroscopy (FTIR). The results indicate that the flame retardant is indeed reacting with the epoxy resin to form a crosslinked network. Future work will involve characterization of the cured epoxy-FR network for physical properties, mechanical properties, and flammability.

### **Applications of Gas Chromatography with Headspace Autosampler**

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Paul Robert Maricocchi

**ADVISORS** Yvonne Y Sun, Erick Vasquez

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The identification and quantification of chemical compounds in a mixture aids in the analysis of a broad range of processes ranging from chemical separation processes to biological separations. In an effort to enhance interdisciplinary collaboration across Units and Departments within the University of Dayton, we seek to understand and develop Gas Chromatography (GC) and Headspace-GC (HS-GC) analytical methods for use both in the classroom and research. The overall goal of this research is to present a summary and explanation of the variables that are manipulated in a GC equipment for the development of characterization methods. Calibration curves will be used to quantify compounds from different samples. Specifically, the methods and calibrations will focus on: (1) analyzing ethanol content in aqueous and organic mixtures, which ultimately can be applied to chemical engineering unit operations such as distillation and fermentation; (2) characterizing the efficiency of liquid-liquid extraction processes, which will be characterized using HS-GC; and (3) a biological application towards characterizing SCFA (short chain fatty acids) content in *Listeria* metabolites present in mice feces. This is an interdisciplinary project scheduled for this coming summer with Dr. Sun of the Biology Department, along with Dr. Vasquez of the Chemical Engineering Department. Ultimately, this research will culminate in an Honors

Thesis that will help to obtain various GC methods for a variety of processes.

## Combinatorial Effects of Silver Nanoparticles and Hypoxia on Lung Cells

School of Engineering: Chemical Engineering

Poster - Independent Research

**PRESENTERS** Cameron Mark-Allan Crasto

**ADVISORS** Kristen Krupa Comfort

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Silver nanoparticles are used in a variety of both consumer and medical applications. They possess antimicrobial properties that can stress mammalian cells through the formation of reactive oxygen species (ROS). This experiment looked at A549 human lung alveolar cells with exposure to 10nm silver citrate nanoparticles (AgNPs) in both a normal oxygen environment and hypoxic environment. Cell viability, formation of ROS, as well as the phosphorylation of both HSP27 and NF $\kappa$ B. In both environments, concentrations of 5 $\mu$ g/ml saw significant reduction in cell viability. There was a slight loss in cell viability in the hypoxic environment. The hypoxic environment saw significant increases in ROS at concentrations as low as 0.1 $\mu$ g/ml. In addition, when exposed to 5 $\mu$ g/ml of AgNPs, it was shown to increase phosphorylation of the HSP27, but reduce the phosphorylation of NF $\kappa$ B proteins, which play a crucial role in the stress level of a cell. (We are going to execute another experiment this week, which would combine exposure to AgNPs and low O $_2$  - 10% CO $_2$  on the A549 cell line. Once we get this data, we will update the abstract and be ready for the presentation.)

## Using and Implementing Continuous Stirred-Tank Reactors and Plug Flow Reactors to Study Reactions in Undergraduate Chemical Engineering

School of Engineering: Chemical Engineering

Poster - Course Project, 201810 CME 499 01

**PRESENTERS** Alex Robert Paschal

**ADVISORS** Michael J Elsass, Erick Vasquez

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Understanding the behavior of Continuous Stirred-Tank Reactors (CSTR) and Plug Flow Reactors (PFR) is vital to graduates of the University of Dayton's Chemical Engineering Program. This primarily is due to the widespread usage of these reactor types in commercial settings; therefore, students should be exposed to 'hands-on' laboratory experiences with these type of reactors prior joining the Chemical Engineering workforce. Realizing that the Unit Operations Laboratory is a capstone class, and it lacked adequate education on such reactors, experiments were developed and performed on both types of reactors to establish empirical standards of reaction kinetics and rates that can be used to guide the education of future undergraduate chemical engineering students. Overall, the CSTR and PFR reactors were used to develop theoretical and empirical understandings of the reactor systems based on calibration of reactor system mechanics; non-reactive qualitative experiments; and bimolecular-reactive experiments. Specifically, the saponification reaction between Sodium Hydroxide and Ethyl Acetate producing Sodium Acetate and Ethyl Alcohol was the primary reaction analyzed in this work. As a quantitative result, models of the studied reaction in both types of reactors were developed and compared. In addition to this common experiment, reactions for future studies to be tested by undergraduate students using green solvents and reactants are suggested. Ultimately, this work will lay the foundation of chemical reactor analysis in the Unit Operations Laboratory at the University of Dayton.

## Understanding the effects of double activated carbon, desorption temperature and time, and possible ethanol decomposition during desorption on Solar Thermal Adsorption Refrigeration (STAR) system

School of Engineering: Chemical Engineering

Poster - Graduate Research

**PRESENTERS** Bipin Karki

**ADVISORS** Jun-Ki Choi, Amy R Ciric

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The off-grid location and unreliable electricity supply to medical clinics in remote parts of India make it difficult to safely store vaccines and other medications using traditional refrigeration systems. The Engineers in Technical Humanitarian Opportunities of Service-learning (ETHOS) program at the University of Dayton, in collaboration with Solar Alternative and Associated Programmes (SAAP) of Patna India, are developing a novel refrigeration system which works on the principle of solar thermal adsorption. This refrigeration system does not require electricity for operation and uses safe, environmentally benign and locally available adsorption pair of ethanol-activated carbon. A bench-scale prototype was developed at the University of Dayton using ethanol-activated carbon as working pair which can generate evaporative temperatures between 20C and 80C. The existing horizontally oriented system can achieve targeted refrigeration temperatures (2-80C) during the adsorption cycle and ethanol can be desorbed from the activated carbon during desorption. However, the horizontal geometry inhibited the return of liquid ethanol to the evaporation chamber. A new vertical oriented bench scale system was built to address the limitation of the original prototype. The effects of double activated carbon on evaporative cooling, heating temperature and time during desorption, and possible decomposition of ethanol during desorption was analyzed. The evaporator temperature -12.70C achieved during the experiments indicates better adsorptive

cooling with double activation technique of activated carbon. Experimental results suggested better desorption happens at elevated temperature (105 - 1150C) and most of the desorption happens in the first 2 hours of heating the activated carbon chamber. The pressure drops on ethanol side pressure gauge reading during desorption and analysis of mass spectroscopy of desorbed ethanol obtained from the chemist showed possible decomposition of ethanol preventing multiple cycle operation of the system.

### **Human detection on omnidirectional camera imagery by multi-feature fusion based on gradients, color and local phase information**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Hussin Khalifa A Ragb

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Field of view of the traditional camera is limited such that usually more than three cameras are needed to cover the entire surveillance area. The use of multiple cameras usually require more efforts regarding camera control and set up as well as they need additional algorithms to find the relationships among the images of different cameras. In this research work, we present a multi-feature algorithm that employs only one omnidirectional camera instead of using multiple cameras to cover the entire surveillance region. Here we use the image gradients, the local phase information based on phase congruency, the phase congruency magnitude, and the color features. These features are fused together to build one descriptor named as "Fused Phase, Gradients and Color features (FPGC). The image gradients, and local phase information based on phase congruency concept are used to extract the human body shape features. Either LUV or grayscale channel features are used according to the kind of camera used. The phase congruency magnitude and orientation of each pixel in the input image is computed with respect to its neighborhood. The resultant images are divided into local regions and the histogram of oriented phase, and the histogram of oriented gradients are determined for each local region and combined. A large pool of the candidate features is randomly generated for one channel of the phase congruency magnitude and three LUV color channels. All these features are fed to a decision tree Adaboost classifier for training and classification between the classes. The proposed approach is evaluated on a challenging omnidirectional dataset and observed promising performance.

### **A Low Power High Throughput Architecture for Deep Network Training**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Yangjie Qi

**ADVISORS** Tarek M Taha

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

General purpose computing systems are used for a large variety of applications. Extensive supports for flexibility in these systems limit their energy efficiencies. Neural networks, including deep networks, are widely used for signal processing and pattern recognition applications. This poster presents a digital multicore on-chip learning architecture for deep neural networks. It has memories internal to each neural core to store synaptic weights. A variety of deep learning applications can be processed in this architecture. The system level area and power benefits of the specialized architecture are compared with an NVIDIA GEFORCE GTX 980Ti GPGPU. Our experimental evaluations show that the proposed architecture can provide significant area and energy efficiencies over GPGPUs for both training and inference.

### **Model Predictive Control Energy Dispatch to Optimize Renewable Penetration for a Microgrid with Battery and Thermal Storage**

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Ibrahim Aldaouab

**ADVISORS** Malcolm W Daniels

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

As intermittent renewable energy becomes a larger fraction of the overall energy mix in the US, algorithms that efficiently utilize this energy are necessary. In this work, a model predictive control (MPC) method is developed to perform real-time optimization to maximize the power delivery from a renewable supply to a building. An isolated microgrid scenario is considered, consisting of a mixed-use residential and commercial building, renewable power supply, battery storage, hot water tank thermal storage, and a backup supply. The MPC strategy utilizes predictions of the building's electrical and hot water loads, on an hourly basis, along with predictions of the output from the renewable supply. At each time step, these predictions are used to create an optimized power dispatching strategy between the microgrid elements, to maximize renewable energy use. For a fixed size microgrid, the performance of this MPC approach is compared to the performance of a simple non-predictive dispatching strategy.

### **Brain Machine Interface Software Application for Data Collection, Thought Analysis, and Robotic Arm Control**

## School of Engineering: Electrical and Computer Engineering

Poster - Capstone Project

**PRESENTERS** Jason Demeter, Alexander Robert Jereb, Clayton T Kern, Brad Richard Sorg, Jamie Stanton

**ADVISORS** Vijayan K Asari, Garrett Craig Sargent

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The overall purpose of the ongoing Brain Machine Interface (BMI) project is to develop an electroencephalography (EEG) interface and a robotics control application which will further enable people with disabilities to achieve autonomy. The project consists of developing, building, and testing an end-to-end system to translate raw EEG data into actionable information. This can be used to control a robotic arm and for other research purposes. A BMI is a system that collects the brain's electromagnetic signals by utilizing sensors, extracts meaningful signals from the data, classifies thoughts, and ultimately uses thoughts as an input to a computer system. The computer system then has the ability to control hardware and software, which for this project is a robotic arm. The team improved the robotic arm user interface, developed a graphical user interface (GUI) for thought recognition, and explored future research paths by partnering with local experts. To improve the usability of the robotic arm user interface, the team developed software that allows easier performance of useful activities, such as using a pen to play tic-tac-toe, playing piano, and picking up objects. The Insight headset by Emotiv was used by the team for data collection. The headset can stream real time EEG data and control signals, however the Emotiv software solution for data collection is closed and proprietary. To use the Vision Lab's noise reduction and muscle signal removal algorithms, the team created a GUI to train the thought classification system and collect and process the data. EEG phoneme detection is a future research path that allows for thought to speech translation. The team investigated EEG phoneme detection by implementing algorithms which can identify phoneme sounds from audio recordings. Using these working algorithms, further research will implement phoneme detection using only EEG signals with no audio.

## The Application of Neurologically-Controlled Robotics to Actuated Feeding Arms

School of Engineering: Electrical and Computer Engineering

Poster - Honors Thesis

**PRESENTERS** Timothy Edward Dombrowski

**ADVISORS** Raul E Ordonez, Temesguen Messay Kebede

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The medical industry is constantly performing research and trying to combat various diseases that afflict humans. Despite advancements in technology, there still remain diseases that have no cure but seem prime candidates for neurologically controlled robots. One such category of diseases consists of various muscular dystrophic diseases. Diseases such as ALS and Parkinson's have limited options regarding treatment, but by brain controlled interfaces (BCI's), robotics can help mitigate the impact on a patient's quality of life. By utilizing a functioning mind, an electroencephalographic (EEG) helmet can be used to control various exoskeletal systems and even prosthesis in order to compensate for a damaged motor system. Through the use of neurologically controlled robotics, a user's motor control and motor strength can be rehabilitated and maintained despite the effects of muscular dystrophic diseases. The goal of this project is to use this experiment to demonstrate the current effectiveness of brain actuated robotics and telepresence that utilize an EEG Sensor. From this assessment, recommendations and further improvements can be made to this existing technology for it to be better suited for electrical engineering and biomedical applications, while simultaneously taking the technology into a new realm of application.

## Variable Stiffness Series Elastic Actuator for Collaborative Robots

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Manoj Kumar Sharma

**ADVISORS** Raul E Ordonez

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Robotic manipulators with joints that are capable of precisely monitoring the instantaneous torque are currently being used in collaborative robots. These robots are safe to work alongside human beings, and execute tasks that rely on force control. A spring is placed in series inside a robotic joint actuator deflects as per the torque transfer; this information is then used by the controller to control the robot as needed. Based on this key idea, a new device is invented wherein the spring stiffness can be servo-controlled. An intelligent controls scheme is developed that helps to create a safe collaborative workspace.

## Convolutional Neural Network Based Multi-view Object Classification

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Zhiyuan Xie

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

In recent years, neural networks have become more and more popular because of their outstanding performance in the object classification area. The convolutional neural network (CNN) is a deep learning, feed-forward neural network that has excellent

performance in visual imagery analysis area. The idea of the connectivity pattern between neurons of the CNN came from the organization of the animal visual cortex. For human vision, different observational directions of objects can get different views. Human can easily recognize objects in different observational directions, but machines cannot achieve this easily. Therefore, multi-view object classification has been researched for many years. To solve this problem, we design an efficient CNN architecture to perform classification of the multi-view images of objects by appropriately choosing the number of layers, the sequence of layers cascading, and size of the filters. Then, we improve the classification performance by adding image enhancement techniques before CNN as a preprocessing stage. CNN extracts various significant features of the image. It is expected that an enhanced image helps to extract stronger features. The training and testing input images of the CNN are original images or enhanced images. The image enhancement is performed by nonlinear enhancement techniques such as multilevel windowed inverse sigmoid (MWIS) function based technique or a locally tuned sine nonlinearity (LTSN) technique. It is observed that the preprocessing by image enhancement provides improved performance in the cases of the smaller training set. Research work is in progress to modify the CNN architecture to see the impact of recognition performance for multi-view object classification. Advanced non-linear enhancement technologies might also be investigated to see the effectiveness in classification.

### Mobile Sensor Lab

School of Engineering: Electrical and Computer Engineering

Poster - Independent Research

**PRESENTERS** Brandon Mckenzie Hampshire

**ADVISORS** Vijayan K Asari

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The Vision Lab has many projects that involves data collection from various sensors. These sensors can vary by platform and programming language. In order to centralize data collection, the Robot Operating System (ROS) is applied to the Clearpath Husky robot. The Husky is made for multi-terrain transport and can be modified to carry multiple sensors. The Robot Operating System is not an operating system but is a network centralized library. ROS provides background services and different language libraries that allow sensors and languages to communicate to a common location. In addition, the libraries can let the user to receive data from the central network thus allowing multiple cross language platform communication. An application of these components can assist in data collection for environment 3D reconstruction. Environment 3D reconstruction requires depth imagery, RGB imagery, and orientation of the camera. The Husky provides estimated orientation to ROS and ROS supports the Microsoft Kinect. With open source coding, the Husky can be coded to collect the necessary data for 3D reconstruction.

### Deep Neural Network Based on FPGA

School of Engineering: Electrical and Computer Engineering

Poster - Graduate Research

**PRESENTERS** Shuo Zhang

**ADVISORS** Tarek M Taha

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

With the rapid proliferation of computing systems and the internet, the amount of data generated has been increasing exponentially. This includes data from mobile devices, where almost all information is now becoming computerized, and science experiments, where large simulations on supercomputers are increasingly becoming the norm. With this massive increase in data, a key issue is how we process and make sense of this data. This is called the "Big Data" challenge. Deep learning is a class of mathematical algorithms that is now heavily used for Big Data analytics. These algorithms are based on very large scale neural networks. One of the key challenges with deep learning is that it requires massive computing power. At present clusters of high performance graphics cards designed primarily for computing (known as GPGPUs) are used for these tasks. A key problem with clusters of GPGPUs, is that they consume large amounts of energy, thus making it difficult to scale existing massive computing systems to future Big Data volumes. The deep neural network designed by Parallel Cognitive Systems Laboratory is based on application specific integrated circuits (ASIC), which provides high performance at reasonably low power consumption. However, these are extremely expensive to fabricate. The Field Programmable Gate Array (FPGA) is a type of integrated circuit that can be reconfigured to implement a large range of arbitrary functions according to application requirements. FPGAs are much cheaper than ASIC and consume less power than CPU and GPU. The objective of this proposal is to develop deep learning network based on FPGA. I will optimize the whole design to make it more suitable for the deep learning. Several pattern recognition applications which use deep learning will be used to test and evaluate the design.

### Leadership and Diversity of Professionals Working in Healthcare

School of Engineering: Engineering Management, Systems, and Technology

Poster - Graduate Research

**PRESENTERS** Emily E Kloos

**ADVISORS** Sandra L Furterer

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This study relates to previous research done to find out why women engineers leave engineering. It is said that women make up more than 20% of engineering school graduates and yet only 11% of practicing engineers are women, despite various efforts to



address the gender gap. Through research, it has been found that many women engineers move from manufacturing and other engineering facilities to service industries such as Healthcare. The purpose of this research is to take the past research done and find out if women engineers working in Healthcare face the same issues as the women engineers in manufacturing or similar environment. 58% of the Healthcare companies are non-profit, 22% are owned by government and 20% are investor owned. There are about 3100 hospitals in Health systems in the United States. Healthcare centers in the United States will be contacted through e-mail, LinkedIn or by appointment. The research topic will be discussed with the management/HR teams at each center to see if they are interested to participate in this study. A survey has been created to distribute to the participating centers. The target respondents for this study are women with an undergraduate degree in engineering but will also use other men and women currently working in Healthcare. We are expecting over 30 Healthcare centers to participate and will compare results of those who never entered engineering field to women who had worked in an engineering field in the past. The survey results will be collected through Google Forms and the results will be compared to the findings in previous research articles.

## Cluster Computing with the Raspberry PI

School of Engineering: Engineering Management, Systems, and Technology

Poster - Course Project, 201780 ECT 466 01

**PRESENTERS** Ali Hussain Alwahimed

**ADVISORS** Mohammadjafar Esmaili

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

## Performance Evolution of GPU versus CPU in Iterative algorithms

School of Engineering: Engineering Management, Systems, and Technology

Poster - Independent Research

**PRESENTERS** Hassan Ali Alsaad

**ADVISORS** Mohammadjafar Esmaili

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

High-performance computing is one of the most demanding technologies in today's computational world with a variety of applications such as big data analysis, and solving complex computing algorithm. Engineers have invented multiple technologies such as CPUs, GPUs, GGPUS, FPGAs, clusters and distributed high-performance computational systems for high-performance computing. This research has focused on evaluating GPU and CPU two of the main technologies that could be used in high-performance computing. The researchers have developed a methodology to evaluate the performance of GPU and compare it with CPU under different test subjects. Finally, this research illustrated the power and weaknesses of GPU over the CPU under certain circumstances.

## Waiting and Service Time Optimization During Lunch at Milton-Union Elementary School Cafeteria, Dayton, OH

School of Engineering: Engineering Management, Systems, and Technology

Poster - Capstone Project

**PRESENTERS** Saud Abdulaziz M Alshaikh, Emma Raye Trappe

**ADVISORS** Sandra L Furterer, Daniel J Zalewski

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Long waiting time by itself is a bad experience, but when you couple it with a limited available time to have lunch, that is a recipe for disaster. Milton-Union Elementary School found this out the hard way, as they were trying unsuccessfully to run their lunch process in a timely manner. Apparently, dealing with little, hesitant, uncertain kids about their meal choices, along with the constraint of time was a bit hard to intake by the teachers and lunch worker, ending up with kids being yelled at and continuous complaints by the teachers. There are high school and middle school students in the same building. They are using the same cafeteria for their lunch and they eat before the elementary school. The management stated that the only problem being encountered is with the elementary school students finishing their lunch effectively in a timely manner. There are 679 students in the elementary school distributed over 32 classes. Each class has 30 minutes for lunch followed by another 30 minutes for recess. To manage all schools lunch timing, all students at elementary school must finish their lunch within 90 minutes starting at 11:25 AM. Two lines are there to serve the students and all classes are scheduled to be released in batches with two classes per batch. Those batches are separated by 3-5 minutes as an effort to reduce the long-stacked waiting queue, which normally considered as part of that 30 minutes of lunch. Each lunch line has two servers and one cashier, except for line 2 where there is one more cashier for a limited time only (from 11:25 AM to 12:20 PM). Management believes that elementary students need at least 20 minutes to eat their lunch, otherwise they will consume less of their entrees, vegetables, and milk which means that the kids won't meet their nutritional needs. Moreover, this often leads having an unsatisfied child for the rest of the day beside the posed long-term health risks to students. Unfortunately, management tried several improvement tactics to have the waiting and service time not exceeding 10 minutes with no success. As stated by the management, that time may exceed 15-20 minutes which is usually associated with teachers being tense and nervous beside having a chaotic environment. Other problems have been disclosed by the management as well. Dining space was one of those problems as there are not enough seats for all students. There are 16 handicap accessible seats that are currently not utilized at all. Too many choices for entrees was one of the problems as well. A third one was the layout of the cafeteria lines that could be improved. The objective of this research is to maintain the average time of waiting plus service to be equal to or less than 10 minutes by April

23rd, 2018. The research will consider the future growth as well of the elementary school to its recorded capacity.

### **Advance cooling feedback system**

School of Engineering: Engineering Management, Systems, and Technology

Poster - Course Project, 201751 ECT 408 61

**PRESENTERS** OMAR Mohammed Alokali

**ADVISORS** Mohammadjafar Esmaeili, Jim E Globig

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

It is an advanced cooling feedback control system, attached with a motor control.

### **Design of a Self-Orienting Solar Array for Small Low-Earth Orbit Satellites**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Honors Thesis

**PRESENTERS** Eric Matthew McGill

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

As electronics have become increasingly smaller and more capable, small satellites called cubesats are deployed in missions that would have taken much larger spacecraft 30 years ago. To power these satellites while in orbit, a novel solar array design is proposed by which these small satellites may harvest energy. With the inspiration of a sunflower that autonomously faces the sun as it passes overhead, a solar array possessing similar characteristics is desirable. The proposed design could generate more energy during the craft's time in the sunlight by continuously adjusting to face the sun. More energy gathered corresponds to an enhancement of the capability of these cubesats due to the ability to accomplish missions with greater scope than those currently in use.

### **Displacement Analysis and Rigid Body Guidance in Spherical Linkages Using $SU(2)$ and Homotopy Continuation**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Saleh Almestiri

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This work seeks to efficiently and systematically model and solve the equations associated with the class of design problems arising in the study of spherical kinematics. To accomplish this, the group of special unitary matrices,  $SU(2)$ , is utilized.  $SU(2)$  is used to analyze and synthesize the kinematics of a variety of systems including the three-roll wrist, the spherical four-bar mechanism, and the spherical Watt I linkage. Two methods of formulating the synthesis problem are considered. Specifically, the five orientation synthesis of a spherical four-bar mechanism and the eight orientation task of the Watt I linkage are solved using both the loop closure equations and an approach derived from the dot product that recognizes physical constraints within the linkage. Finally, using  $SU(2)$  readily allows for the use of a homotopy-continuation-based solver, in this case Bertini. The use of Bertini is motivated by its capacity to calculate every solution to a design problem.

### **Development and Actuation of a Shape-changing Rigid-body Human Foot Prototype**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Tanner Rolfe

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project focuses on the actuation of a multi-segment rigid body foot prototype capable of matching the change in profile of a human foot during gait. Previous work has focused on the design of the prototype using methods of shape-changing kinematic synthesis. In order to actuate the prototype, a tendon-based actuation scheme was conceived and partially implemented. The current prototype includes a series of paired cables, each connected to a separate segment of the foot. Tension in the cables counteracts the force of torsional springs implemented at the joints keeping the segments positioned in a neutral configuration, allowing each segment to achieve appropriate plantar- and dorsiflexion to match gait-derived configurations. Current work focuses on implementing active elements to drive the cables, as well as refinement of joint stiffness to increase the functionality and biomechanical accuracy of the prototype.

### **Validating the Location and Tracking of a Human's Center of Mass Using a Statically Equivalent Serial Chain**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Luke Evan Schepers

**ADVISORS** Andrew P Murray, David A Perkins

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This project seeks to validate the use of a statically equivalent serial chain (SESC) in locating and tracking a human's center of mass (CoM). The statically equivalent serial chain used in this project is comprised of 13 parameters, each roughly corresponding to a portion of the human body. Given these 13 parameters, the SESC points directly at a person's CoM. Every individual has a unique set of parameters to calculate their SESC. These parameters are determined by capturing poses and using the body segment length and position information, as well as the center of pressure reading, acquired from the different poses. A Wii Balance Board and Xbox Kinect were used in this study as inexpensive force plate and motion capture systems. There are other methods for calculating a person's center of mass, but these require expensive equipment and more complex computational processes. The method proposed here is a low cost, fast, and easy way to accurately predict a person's CoM. In order to determine the feasibility of the SESC model, subjects of varying body types were tested, and SESC predictions for the CoM were checked for both accuracy and repeatability. A minimum number of poses required to achieve an accurate CoM prediction was determined by figuring out where subject parameters converged, which increases time efficiency of the process. Additionally, it was found that the number of frames required to capture a pose could be decreased from 30 to 15 frames without sacrificing accuracy. This resulted in a total testing and setup time of 30 minutes per subject, opposed to one hour previously. Thus, validating the SESC method as a fast, easy, and fairly accurate solution for predicting a human's CoM.

## Experimental Validation and Reliability Testing for Center of Mass Body Tracking

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Kevin Michael Brand

**ADVISORS** Andrew P Murray, David A Perkins

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Determining and then tracking the center of mass is difficult for a connected system of segments, such as a human, animal, or humanoid robot. Available techniques to perform these operations are complicated, time-consuming, or expensive. The technique known as Statically Equivalent Serial Chain (SESC) modeling promises to be inexpensive, using only an Xbox Kinect and a Wii Balance Board for equipment, and quick because only a modest number of subject poses are needed. Although SESC models have previously proven to reasonably estimate the center of mass (CoM) of systems of bodies from a limited number of experiments, recent validation testing shows the capacity for significant improvement. This research aimed to improve upon current testing protocols, reduce sensor error through improved calibration, and refine the algorithm employed to produce more meaningful parameters. As the CoM is an important parameter in gait analysis, SESC methods are prominent when considering in-home rehabilitation techniques that are versatile enough to improve potentially offset CoM problems for people of differing body types and sizes. Due to this significance, the research performed continued the development of the SESC technique toward its use in individualized rehabilitation protocols.

## Dynamic Analysis of Alternative Mechanical Press Linkages

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Hardik Hasmukhbhai Viradiya

**ADVISORS** Andrew P Murray, Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The goal of this project is to compare the dynamic characteristics of alternative linkages for a mechanical press. Mechanical presses are the most common machine used in the mass production of sheet metal parts. Forming sheet metal parts, such as a car door or a tin can, involves striking a flat piece of metal with a die that shapes the part and punctures holes. A conventional press uses a slider-crank linkage and flywheel to provide a high energy strike for a short time period. A motor delivers torque to a flywheel that in turn, provides the rated capacity (tonnage) during the strike. Certain operations, such as deep drawing, require a longer dwell time than is possible with the slider-crank design. Various alternative linkages are proposed that have the ability to provide long dwell times. A dynamic analysis of each linkage is essential to understand motor demands, joint loads, and efficient design options. The linkage analyses are performed using SolidWorks multi-body dynamic simulation software.

## Moving towards tuning of ankle-foot orthoses: The influence of carbon and plastic AFOs for individuals with Multiple Sclerosis

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Sarah Elizabeth Hollis

**ADVISORS** Kim E Bigelow, Kurt J Jackson

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Mobility impairments are reported as the most debilitating symptoms for individuals with Multiple Sclerosis (MS). Fatigue, a major

symptom of MS, further affects mobility. Ankle-foot orthoses (AFOs) are one potential solution to alleviate some of these mobility impairments; however, the effectiveness of AFOs for individuals with MS are currently inconclusive and have known downfalls. We took a comprehensive look at both carbon fiber and polypropylene AFOs to gain an understanding of the immediate effects of AFOs for individuals with MS. In collaboration with the University of Dayton's Doctorate of Physical Therapy Program, data was collected for 10 participants on various balance, gait, and strength/fatigue assessments. Overall, no significant differences existed between the baseline, carbon, or plastic AFO conditions for any assessment outcome ( $p > 0.05$ ); however trends did arise within the static and dynamic balance task results. Many outcome parameters varied among participants, suggesting the importance of individual responses to AFOs and patient preferences in prescribing AFOs. The majority of participants preferred the carbon AFO. All AFOs were off-the-shelf with only slight adjustments to account for fit and alleviate any pain, AFO tuning is believed to help optimize the efficiency of AFOs by adjusting the angle of the shank during midstance and the stiffness of the footplate. The next step in this work is to investigate the effects of AFO tuning in collaboration with area clinical partners. A case study is currently underway to give insight and better understanding to the effects of AFO tuning.

### **Spatial Morphometric Analysis Using Shape-Changing Rigid-Body Chains**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Yucheng Li

**ADVISORS** Andrew P Murray

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Morphometry is the quantitative comparison of shapes, primarily curves. As an alternate to classical methods of spatial morphometry, this work investigates a kinematic synthesis methodology for designing a spatial chain of rigid-bodies to match arbitrary spatial curves. The goal is to find a single set of spatial bodies that can be moved to approximately align with any given set of spatial curves. Previous rigid-body shape-change morphometry work focused on mechanisms composed of rigid planar links connected by prismatic and revolute joints to approximate planar curves. Open space curves are the current focus of the research. The primary advantage of this method is its capacity to describe the difference in space curves with a limited number of parameters.

### **Steady-State Modeling of Condensing Units with an Economizer Loop**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Graduate Research

**PRESENTERS** Haithem Murgham

**ADVISORS** Dave Harry Myszka

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

This work presents an engineering model that simulates the steady-state operation of air-cooled condensing units. Packaged, air-cooled, condensing units includes a compressor, condensing coil, tubing, and fans, fastened to a base or installed within an enclosure. To increase capacity, modern condensing units are being equipped with a brazed-plate heat exchanger for an economizer loop, configured in either upstream or downstream extraction schemes.

### **The Development of a Deeper Understanding of Cantera for use in the Simulation of Modern Combustion Problems**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Shane Thomas Kosir

**ADVISORS** Joshua S Heyne, Rob D Stachler

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

The emergence of computing, such as multiprocessing and raw processing speed, allows for opportunities to simulate chemical models with relative ease. An open source software module, Cantera, is increasing in popularity within the combustion community as well as among other chemistry and chemical engineering disciplines. This software module can be easily integrated into Python or MATLAB and is often used to simulate problems involving thermodynamics, transport phenomena, and/or chemical kinetics. The purpose of this research is to develop a deeper understanding of physically controlling autoignition processes. The time for a fuel to autoignite, often referred to as ignition delay, is an important measure as it describes the reactivity of a fuel under given conditions. Experiments, such as rapid compression machines and shock tubes, can measure this parameter. These experimental values can be compared to simulations performed in Cantera or CHEMKIN, another chemical kinetic software similar to Cantera, to validate chemical kinetic models of given fuel species. It is of interest to investigate ignition delay as it is a contributing factor to the overall chemical timescale relating to lean blowoff (LBO) in a typical gas turbine engine. LBO represents the lowest possible fuel/air mixture, relative to the stoichiometric ratio, before a flame is not self-sustained and becomes extinguished. A better understanding of the time scales leading to LBO could allow it to be used as a criterion for the approval of alternative (non-petroleum) jet fuels.

### **The GEMnasium Experience: Creating a Recycling Enterprise for Individuals in Recovery**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Course Project, 201810 MEE 460 H1

**PRESENTERS** Abby Schubert Lisjak

**ADVISORS** Kevin P Hallinan

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Throughout the Spring semester, Engineering Analysis students have worked in the GEMnasium to explore the creation of a recycling enterprise for individuals in recovery from addiction. This project aims to demonstrate the process taken by the class to design an enterprise that merges wellness activities with work responsibilities. It explores how the enterprise can assist with re-entry as well as the continuation of the recovery process. Wellness, job training, funding, and community input were considered throughout the design process. The recycling enterprise will be presented to Montgomery County officials with the hope to implement the designed program in the county.

### **Improving Cook-Stove Bricks with Organic Material**

School of Engineering: Mechanical and Aerospace Engineering

Poster - Independent Research

**PRESENTERS** Tyler Antonio Dinardo, Brandon Montel Payne, Antonio Keith Thomas

**ADVISORS** Margaret Frances Pinnell

**LOCATION, TIME** RecPlex Main Gym, 3:00-4:15

Ceramic bricks are used all over the world to help build stoves but can prove to be inefficient because of their inability to hold heat, individuals are required to use more fuel that can create harmful fumes. In order to address this a team comprised of teachers and engineers, designed and tested an experiment that used multiple different organic materials that were added to bricks to increase insulative properties by producing more pores in the bricks. These organic bricks were then heat treated then were tested through three-point bend, compression, and porosity tests to determine if adding organic material would create more pores to increase insulative properties without jeopardizing the overall strength of the brick.

### **ACC 602A - Information Assurance Presentations on Analytical Procedures (Part 3)**

School of Business Administration: Accounting

Oral Presentation - Course Project, 201810 ACC 602A 01

**PRESENTERS** Jack Robert Crain, Jacob Michael Finley, Miranda Nicole Kurlandski

**ADVISORS** Marsha K Keune

**LOCATION, TIME** Miriam Hall 104, 3:40-4:40

Master of Professional Accountancy students present the results of a class project utilizing Tableau, a data visualization tool, to develop, evaluate, and communicate analytical procedures commonly performed by external auditors.

### **Living in the Slump: Second Year African American Undergraduate Students' Coping Mechanisms**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Cerelia Victoria Bizzell

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The sophomore experience has been characterized with not only academic difficulty, but also psychosocial challenges (Schaller, 2010). This study sought to describe and examine the many different experiences African American sophomore students encountered at a predominately White institution (PWI). Moreover, this study looked to understand the stress coping mechanisms they have adapted when balancing academics, social life, and extracurricular activities. The findings revealed that African American sophomore students have had difficulty learning to trust their institution's resources, have had a hard time balancing their social life, and have felt the need to mature faster than others. Incorporating a narrative study approach allowed students to reflect on their interpersonal and intrapersonal development, and give detail to how they dealt with the obstacles they faced during their second year. Future studies could focus on a particular gender in order to analyze the different stress coping mechanisms utilized by students.

### **Agents of Change: Influence of Service Learning and Volunteerism on Career Choice among Military Personnel**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Marcia Mills Nehring

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Since 9/11, more is known in the field of College Student Affairs about how to support military students who transition into college.

Engaging these nontraditional students in service learning and volunteerism has shown to influence career choice, increase completion rates, and strengthen community partnerships (Sims, 1989; Travor & Kates, 2014). With higher numbers of unemployment rates for this population, the purpose of this qualitative narrative research study is to explore the perspectives of military students and staff at a Community College in mid-western Ohio, whose career choices were influenced by volunteerism and service learning. The primary investigator used a confidential interview protocol. The findings could inform future studies and encourage community buy-in to engage military personnel in nonprofit activities that may influence their future career choices. Waddell (2011) says, "The significance of entire concept of community service or service learning is directly linked to their military core value of mission first and service before self" (p.18). This study adds to that conversation.

### **High School Students + Vocation Education = Better Decisions? A Mixed Methods, Group Comparison Study of Students at a Midwestern, Suburban High School**

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Julie M Huckaba

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Every year, students who have just graduated high school blithely begin their journeys through postsecondary education, some choosing two-year colleges, some embarking on degree paths at four-year institutions, and others choosing military service, apprenticeships, or work. The purpose of this mixed methods, group comparison study is two-fold: (a) to examine the difference between the pre and post Brief Calling Scale scores of high school seniors and juniors (n = 37) exposed to the Ikigai/Vocation discussion workshop, and (b) to evaluate the influence of the Ikigai/Vocation discussion workshop on the postsecondary decisions of these students. The findings of this study increase our understanding of how student development relates to postsecondary decisions after being exposed to a Vocation workshop utilizing the Japanese concept of Ikigai and the intersection of Character Strengths -- 24 traits that all individuals possess in varying degrees.

### **A Nationwide Study on the Impact of Racial Battle Fatigue on Black Student Affairs Professionals**

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Beverly Auston Dines

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, online survey-based study is to explore racial battle fatigue and its impact on Black student affairs professionals across the United States. How do Black student affairs professionals describe racial battle fatigue and its impact on their professional lives? The findings enhance our understanding of the needs and opportunities for advocacy as it pertains to these professionals. The survey results are organized by theme and analyzed for trends and best practices.

### **Data for our Students: How Three Large Public Universities Use Tech-Based Solutions to Foster and Track Student Success**

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Ellen Elizabeth Marburger

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Using technological applications and databases for tracking student success in higher education is slowly becoming a necessity rather than a recommendation, especially at large campuses. This content analysis study sought to examine the breadth and depth of the use of these applications amongst three such universities in the midwest by analyzing and coding publicly available data around the themes of evaluation strategies, solutions, and communications. This study first examined the current commentary and research around this topic and defined student success indicators, identified three campuses, and finally compared the systems used, purposes for each, capabilities of each, and what gaps may still exist in the context of using such technology to assist in student success. Key findings suggest that this subset of the field is evolving, and widespread use and integration of these systems may be the next step for campuses and professionals, supplemented by future research.

### **A Journey Towards Multiculturalism: Cultural Identity Development Among Chinese International Students**

School of Education and Health Sciences: Counselor Education and Human Services  
Poster - Graduate Research

**PRESENTERS** Yuan Zhou

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

This is a qualitative, narrative research study examining the stories told by six undergraduate Chinese international students about their transitional journey from a monocultural to multicultural identity. In the interviews, students were asked to reflect on their understanding of self, Chinese culture, and American culture. Students were also prompted to reflect on their past experiences in China leading up to their arrival to the United States as well as those while attending the University of Dayton. The commonalities in their narratives showed evidence of internal motivation to immerse themselves in American culture, in addition to the negative and positive encounters with both Chinese and American students on campus.

## **Understanding the Transition from Rural High School Student to Urban College Student**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Hannah Danielle Zimmerman

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, phenomenological study is to understand the transition from high school to college among first year, undergraduate students from rural communities at The Ohio State University. Through the conduct of interviews with 13 participants, I have been able to gauge how rural community high school graduates describe their transition into an urban university setting in one of Ohio's largest cities. Research has shown that students in rural communities are in the lowest of proportions on college campuses, and often it is because they are not exposed to the resources available to prepare for post-secondary education. In this study, students from rural communities have expressed feeling unprepared for college upon graduating high school, and lack of preparedness has been demonstrated through minimal challenging class offerings, unmotivated high school teachers, and not being a part of a college conversation prior to enrolling at the university. My interpretation of the data suggests that some of our rural students may not be exposed to and prepared for post-secondary education, indicating missed opportunities towards maximizing leadership potential and growth within our agricultural communities.

## **They Succeed: Exploring the Academic Success of Undergraduate Black Males at the University of Dayton**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Breana Lynn Smith

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, phenomenological study is to understand the experience of African American male identity and its relation to the academic success of African American male junior and senior students at the University of Dayton. Following the African American identity development models of Cross (1971) and Robinson and Howard-Hamilton (1994) as theoretical frameworks, I explore factors related to African American male students' identities and how these subsequently influenced their academic achievement. The historical research about African American male students in higher education focuses on the deficits this population faces and ultimately feeds into the stereotypes that plague this group (Harper, 2009, as cited in Kim & Hargrove, 2013). Emerging research on the topic of African American male success within higher education has evolved within the last decade and has started to frame an achievement-based representation of Black male collegians. Data was collected utilizing individual, in-person interviews (n = 9) between the researcher and participants. Among my several findings, familial support, campus resources and support, and the desire to do better were top influences in these participants' achievement of academic success. Common among my findings was extracurricular involvement; this trend appeared as a high influence for many of the participants. The influence of African American male identity on the ability and desire of these students to succeed academically emphasizes the need for support and resources for this population within higher education and prior.

## **Final High School GPA, What's the Big Deal?**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Katelyn Brohman

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

This quantitative survey-based study explores whether or not there is a statistically significant correlation between final-year high-school GPA and first-semester college GPA among undergraduate students at the University of Dayton. The purpose of this study is to determine whether or not a final high school GPA is related to success in college. It is not rare for high school students to believe their GPA in high school directly relates to their ability to succeed in college; as a high school teacher, I believe this is incorrect. We put so much stress on high school GPA only for some students to be under-prepared when arriving at college. This study also explores the difference between students' first-semester college GPAs based on their self-identification as (a) not at all confident, (b)

somewhat confident, (c) confident, or (d) very confident about being successful in college before they started as undergraduates at the University of Dayton.

### **Examining the Experience of Choosing a Major among First-Year, First-Generation, Undecided Undergraduates at the University of Dayton**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Adam Thomas Solomon

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Over half of all students who withdraw from college do so within their first year, resulting in a first-year attrition rate of over 25% at four-year institutions, and roughly 50% at two-year institutions (Cuseo, 2005). Undecided students and first-generation students represent two populations who are at the greatest risk of attrition. Since the 1980s, both populations of students have increasingly become the focus of study in the retention literature, and yet little has been written about the intersection of these two student characteristics. This qualitative, phenomenological study attempts to address this intersectionality by highlighting the experience of decision-making around choice of major among first-year, first-generation, undecided undergraduates at the University of Dayton. Data collected via one-on-one interviews with participants reveal their extrinsic and intrinsic motivations for choosing a particular course of study, how they conceptualize choosing a major based on post-college aspirations, concerns about being undecided, and key figures who helped guide them through the process of choosing a major.

### **Cross Cultural Connections: A Phenomenological Study of Intercultural Learning from Intercultural Living**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Megan Jacoby Woolf

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

Higher education administrators and student affairs staff on some residential campuses have attempted to be more inclusive of international students and their U.S. peers by creating co-curricular learning communities addressing intercultural living. Intercultural residential communities, like Cross Cultural Connections (CCC) at the University of Dayton, serve to support the transition to intercultural living for first-year students. Through eight interviews of former CCC residents, this qualitative, phenomenological study explored how the community cultivates intercultural competence. According to the Refined Developmental Trajectory of Intercultural Maturity (Perez, Shim, King, & Baxter Magolda, 2015), former residents of the CCC expressed varying levels of advancements of their intercultural competence. This study assesses the longitudinal success of the CCC's learning outcomes and gives suggestions for similar intercultural residential communities.

### **The Experience of Interaction With and Reporting To the Dean of Students Office among African American Law Students at a Private, Midwestern University**

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Nikeya Lynn Sharp

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The Dean of Students office is a primary advocate for students, providing services and programming that support students in achieving academic and personal success. The office utilizes several departments that it houses as means to connect with and support students. These resources include the offices of Advocacy and Intervention, Community Standards and Civility, Sexual Violence Prevention Education, LGBTQ+ Services, and the Center for Alcohol and Other Drug Resources and Education. Methods for reaching out to and engaging students within each of these offices look different, but all of them include educational programming and unique supports for students. Ideally, these resources would be utilized by all students; however, there seem to be sub-populations of students who tend to take advantage of these services less frequently. One such sub-population is African American law students. Williams (2000) found that African Americans have difficulty reaching out for help from resources due to the fear of being labeled on top of current race related stigmas (p. 243). This purpose of this qualitative, survey research study is to explore the experiences of reporting to and interaction with the Dean of Students office, or reasoning for the lack thereof, among African American law students at private, religiously-affiliated, mid-sized, Midwestern research university. The findings of this anonymous online survey provide helpful indicators for how we can better support these students and ensure they are receiving adequate and equitable support. Having a case management position located within the university Law School could make students more inclined towards reporting concerns of crisis as well as feel more supported.

### **Soaring to New Heights: A Case Study of the AVIATE Program at the University of Dayton**



## School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Keri Lynn Good

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The curricular approach to developing education in residence is becoming more common amongst Housing and Residence Life departments at colleges and universities because the approach is driven by research and assessment is unique to each institution, is intentional, and ultimately centered on learning (Brown, 2017). The University of Dayton implemented a residential education model in 2014 that tied learning in residence and learning from campus partners to the housing assignments process – a triad program called AVIATE, or A Vision for Integrated, Applied and Transformative Education. The University of Dayton's curricular approach to residential education tied with the housing assignments process is unique, and thus the aim of this study was to highlight this initiative. This institutional case study analyzed the development and implementation of AVIATE through interviews with a sample of the professional staff members at the University of Dayton who helped to establish the program. Additionally, university documents, historical information and external contexts were analyzed in relation to AVIATE. Findings illustrate the chronological series of processes by which AVIATE was developed as well as conclusions on how the professional staff members' views on their role in student affairs has evolved as a result of working with a residential curriculum. Implications for future research include analyzing the student perspective and learning through participation in the AVIATE program.

## And Give Me Support: How SUNY Institutions Address Employee Experiences of Burnout

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Conor Matthew Kutner

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this content analysis study is to uncover how higher education institutions in the State University of New York (SUNY) system offer support to higher education professionals in their employment who experience burnout during the course of their work. With the high attrition and turnover rates of higher education professionals (Rosser & Javinar 2003; Tull, 2006), institutions do not seem to be meeting the needs of their employees. This study will utilize a content analysis approach to systematically review the publicly-available literature such as employee handbooks, human resource websites, and employee wellbeing services websites from SUNY system institutions (n = 10). This study seeks to identify a multi-dimensional method (Abbott & Baun, 2015) of addressing these issues and needs, of providing support and services to employees, and to offer recommendations on best practices in responding to those need-specific gaps in future research and progress.

## Exploring Undergraduate, International Student Retention at the University of Dayton

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Emily Mitolo Grasso

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

The purpose of this qualitative, case study is to explore the challenges, responses and best practices of academic units in the retention of undergraduate, international students moving from their first to second year at the University of Dayton. The Deans' offices were surveyed (n = 4) and interviewed (n = 4) electronically, revealing that there are not current retention initiatives for this student population within the academic units. The findings will be shared with the units as well as other support services across campus who may be able to take action to increase persistence of undergraduate, international students past their first year.

## Perceived Barriers to Reporting Incidences of Stalking by Undergraduate Students at a Private, Midwestern University.

School of Education and Health Sciences: Counselor Education and Human Services

Poster - Graduate Research

**PRESENTERS** Antony David Parnigoni

**ADVISORS** Savio Dennis Franco

**LOCATION, TIME** LTC Forum, 4:30-6:30

One in six women and one in 19 men will be victims of stalking in their lifetime (Baum, Catalano, & Rand, 2009). This qualitative, phenomenological research study explores the perceived barriers to reporting stalking-related behavior that undergraduates self-report at a private, religiously-affiliated, mid-sized, Midwestern research university. Undergraduate students (n=22) were interviewed in a one-on-one setting. Barriers that have been recorded in past research have included fear of retaliation, uncertainty that a crime has been committed, or not wanting friends to find out (Fisher, Diagle, Cullen, & Turner 2003; Sable, Danis, Mauzy, & Gallagher, 2010). These previous findings are consistent with the findings of this study. In addition, the majority of students reported that the school could do more to educate on what constitutes as stalking behavior, what the reporting options are, as well as what happens after a report has been filed. These findings are relevant for any university because the research site in this study has already

invested a great deal of resources into combatting partner violence and this evidence suggests that there will always be more opportunities for education and student engagement; in other words, this is an ever-evolving battle that needs to be fought.

## **Facing Dayton: Visualizing Neighborhood Narratives**

College of Arts and Sciences: Art and Design

Visual Arts Exhibition - Course Project, 20178o VAD 345 01

**PRESENTERS** Intisar Alrasheed, Laila Abdullah Alshuwaikhat, Emily Katherine Brady, Annie Brinkman, Jessica Rose Burnham, Erin Butrica, Jesse Chapman Alexander Chapman, Merani Yvonne Cosme, Claire Allison Cullen, Kristin Elizabeth Davis, Sarah Marie Fieldhammer, Beth Margaret Fuchs, Emily Carroll Gorenc, Meg Elizabeth Gramza, Emma Quill Kaufman, Caitlin Rebecca Marshall, Payton Maureen Oakes, Alyssa Elaine Ramstetter, Steven George Rojc, Jeremy N Rosen, Caitlin Joanne Schneider, Cassie Carol Smith, Taylor Katherine Wilson, Nan Xiang, Zhuo Xu

**ADVISORS** Misty K Thomas-Trout

**LOCATION, TIME** Fitz Hall Second Floor, 5:00-7:30

The Facing Project is a community story-telling project that intends to bring awareness about human rights issues and assets of a community to inspire social action ([facingproject.com](http://facingproject.com)). Kelly Bohrer and Alexa Irwin with the Fitz Center have begun one of these projects titled "Facing Dayton: Neighborhood Narratives". The Department of Art & Design Typography Two class—taught by Professor Thomas-Trout—collaborated with Kelly and Alexa. The students were to visualize these narratives through the form of a typographic poster. Typography Two deals with the ideas of the poetic, practical and persuasive nature of typography that encourages designers to investigate content from these varying perspectives. Students analyzed the text and its inherent and potential meaning(s) and then generated several visual iterations. The process revealed ways to integrate the poetic, practical and persuasive ideas within the individual posters. Twenty-five students were paired with 25 different stories from several Dayton communities. The student designers successfully communicated these narratives through the interconnectedness of the poetic, practical and persuasive—allowing the type to speak as the voice of the storyteller. Typographically these posters display poetic in the way it conveys the messages within these stories; practical in the sense that it disburses the information; and persuasive in how it teaches the history of the Dayton communities while raising awareness on current social justice issues. Professor Thomas-Trout received the Experiential Learning Innovation Grant in the Fall of 2017 that helped fund an exhibition at the Dayton Metro Library. Students successfully developed this poster exhibition through these five teams: install, deinstall, curatorial, promotional, reception/food and beverage. This community-based graphic design exhibition, "Facing Dayton: Visualizing Neighborhood Narratives" celebrated community and fellowship through the visual language and promoted the benefit of experiential learning.

## **The Facing Project: Stories of Challenge, Change, and Community | Short Films by Digital Processes II (VAP340) Students**

College of Arts and Sciences: Art and Design

Visual Arts Exhibition - Course Project, 20178o VAP 340 01

**PRESENTERS** Jesse Chapman Alexander Chapman, Annie Ellis Denten, Claudia Grace Ferguson, Sara Elizabeth Frederick, Maura M Parker, Nora Eileen Sullivan

**ADVISORS** Julie R Jones

**LOCATION, TIME** Fitz Hall Second Floor, 5:00-7:30

A collaboration between students from The Department of Art & Design, Digital Processes II (VAP 340) course and selected "The Facing Project" storytellers, narratives, and communities. Each student produced a 3-5 minute short film on highlighted Dayton neighborhoods from "The Facing Project," exploring the changes and challenges that each community faces; several students reached out to and collaborated with community members, whose mission is to raise awareness towards and the enrichment of these places they call home. Short films range from traditional documentary investigation to visually poetic interpretations of the narratives and landscape that define each neighborhood. Featured Dayton neighborhoods include: Carillon, Dayton View Triangle, Edgemont, McCook Field, McFarlane, and Westwood. Special thanks to the residents, businesses, and other partners that contributed to this project, including: Dakota Center, Dayton Kroc Center, Marco and Leona Marmolejo, Jonique McNeal, Sharon Mitchell, Omega Baptist Church, Jackie Patterson, Mary Varnado, and the Fitz Center for Leadership in Community.