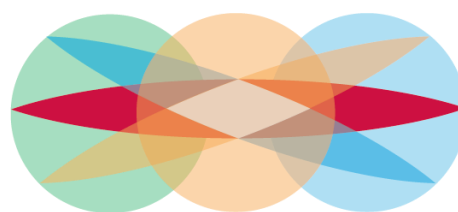


# ABSTRACTS



ST. CLOUD STATE  
U N I V E R S I T Y



HUSKIES  
**SHOWCASE**

**TUESDAY, APRIL 23, 2019**

**ATWOOD MEMORIAL CENTER**

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**Abstract Code:** O1

**Presenter(s):**

Emily DeArmon

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Evolutionary Relationships of Dragonfishes (Stomiidae) with a Survey of Anatomical Variation of their Bioluminescent Barbels

**Abstract:** The deep-sea is a highly understudied habitat where species richness was previously thought to be low due to the lack of geographical barriers. Prior studies have hypothesized that marine lineages living in open-ocean habitats may exhibit lower species richness due to a reduction in genetic isolation among populations. The order Stomiiformes consists of four deep-sea families (~520 species) and have adapted a variety of endogenous bioluminescent organs. The most speciose family, dragonfishes (Stomiidae), is recognized for having species-specific bioluminescent barbels and have been primarily identified through this structure. These barbels are found on the base of the urohyal bone with high variation of anatomical features along the stem and tip, containing luminous tissues. These barbels are hypothesized to be used for prey attraction and communication. Anatomical structures of the barbels can range from simple and elongate stems to the possession of complex structures. These structures include bulbs and bulblets, filaments, and branching networks, as well as flattened/nonbulbous structures. Barbel length can span from less than the head length to six times greater the standard length of the fish (Grammatostomias). The genus, Eustomias, contains over 100 species and includes the most anatomically diverse and complex barbels within Stomiidae. Three genera Astronesthes, Melanostomias, and Idiacanthus, have even been recognized to have sexually dimorphic barbels. While most stomiids possess high morphological variations in their barbels, three genera, Chauliodus, Photostomias, and Malacosteus, completely lack this appendage. In this study we investigate the evolution of barbels across dragonfishes including a character evolution study in the context of a dragonfish tree of life to understand the evolution of this light producing appendage.

**Abstract Code:** O2

**Presenter(s):**

Zachary May

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Evolution of Body Shape in the Deep-Sea Hatchetfishes (Sternoptychidae)

**Abstract:** Stomiiformes (dragonfishes and their allies) are a species-rich order of fishes (~440 species) that are primarily found throughout the meso-bathypelagic zone of the world's oceans. The bodies of Stomiiformes are covered in an array of bioluminescent photophores that produce light in their near-dark to dark environment. In contrast to the more elongated body plan of most stomiiform fishes, the family Sternoptychidae (hatchetfishes, ~78 species) has evolved a hatchet-like body shape. Few studies have investigated the evolution of body shape among stomiiform fishes, a lineage that has evolved exclusively in a pelagic deep-sea environment. In this study we use landmark-based geometric morphometrics to examine the differences in body morphology across the family Sternoptychidae. We also explore the evolution of body shape among hatchetfishes in the context of their evolutionary relationships inferred from a synthesis of genome-scale sequencing with ultraconserved elements and protein-coding gene fragments.

**Abstract Code:** O3

**Presenter(s):**

Devon Dell

**Faculty Mentor(s):**

Ryan Fink

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** How Many Sub-Species of Salmonella Are in Your Salad?

**Abstract:** Salmonella is a pathogenic bacterium that is commonly known to infect humans and animals, resulting in approximately 19,000 hospitalizations and 380 deaths yearly. Recent studies have discovered eating contaminated fruits and vegetables to be a major source of Salmonella outbreaks. These studies have shown that some serovars of Salmonella are not only found on the surface of the fruits and vegetables, but are actually found living within the fruits, leaves, and roots of the plants. This is cause for major concern as surface sterilization of the edible products would not be enough to prevent an outbreak. There are two species and six sub-species of Salmonella. These Salmonella sub-species are very similar genetically and produce many similar virulence factors and secretion proteins. These virulence factors and secretion proteins are predicted to be what enables Salmonella to enter, grow, and survive within their plant host. Comparing the location, growth and survival of the Salmonella sub-species (Bongori, Enterica, Arizonae, Diarizonae, Salamae, Indica, and Houtenae) within a model organism (*Arabidopsis thaliana*) will provide a further understanding of how plants may act as a host organism to the Salmonella species. This along with a genomic comparison of the secretion proteins from all Salmonella sub-species could help to identify what genes are necessary for the survival of Salmonella within a plant host. With this information we could reduce the number of plant related Salmonella outbreaks.

**Abstract Code:** O4

**Presenter(s):**

Elliot Murzyn

**Faculty Mentor(s):**

Ryan Fink, Melanie Melendrez-Vallard

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Isolating and Culturing Methanogens from Fermenter Samples: A First Step Towards Synthetic Biogas Producing Microbial Communities

**Abstract:** With the threat of climate change upon us, the need for bio renewable energy has never been more necessary. As major influences to our climate, we have the responsibility to take care of our planet and prevent further denaturing. A potential solution is through biogas as a renewable energy source. Biogas can be produced from waste products such as manure from dairy farms and can be converted into electricity. The aim of this project was to isolate and culture the microorganisms responsible for methane production and provide a stable system for biogas delivery. As a first step towards this goal, we developed a simple but effective protocol for isolating and culturing methanogens under anaerobic conditions using anaerobic cylinders and gaspaks to produce an oxygen-depleted environment. Using a sample from a batch fermentation experiment and a pure culture of the methanogen *Methanobrevibacter gottschalkii* as a control, samples were tested for growth in thioglycolate and Brain Heart Infusion (BHI) media under aerobic and anaerobic conditions. Tubes that exhibited growth exclusively under anaerobiosis were selected and transferred to both SAB and BHI agar plates and grown under anaerobic conditions to obtain isolated colonies. Isolated colonies were then inoculated into hungate tubes (tubes specially designed to culture anaerobes) with corresponding media and allowed to grow. Methane was recorded between 40 ppm and 80 ppm for *Methanobrevibacter gottschalkii* in BHI and SAB media and above 640 ppm from tubes containing combined mixtures of isolates from the fermenter sample suggesting that they contained either a high concentration of a single methanogen or many different species of methanogens. Mixed culture tubes that tested positive for methane were further isolated using plates containing BHI within anaerobic culturing conditions and tested for methane production until isolated methanogens of a single colony morphology were obtained and could be further characterized.

**Abstract Code:** O5

**Presenter(s):**

Katie Koetz

**Faculty Mentor(s):**

Gareth John, Mikhail Blinnikov

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Demographic and Landscape Change in Linden Hills, Minneapolis: A Case Study in Gentrification

**Abstract:** Demographic and Landscape Change in Linden Hills, Minneapolis: A Case Study in Gentrification Linden Hills, a Minneapolis neighborhood best known for its hilly Linden-tree lined streets, charming homes, parks, and boutique-style shops, is undergoing a transformation from an older generation neighborhood, of lower-income, into a trendy, young urbanite area—a process commonly referred to as ‘gentrification.’ Using city records and Google Map’s Street View and drawing on results from a survey of Linden Hills residents, I identify changes in the residential landscape of Linden Hills over the past 50 years and gather opinions on gentrification and the resulting community transformation. From this I was able to see how personal identities changed as landscape transformed. Through survey and observation, I analyzed that international food offerings within this neighborhood demonstrate how residents have accepted global influences amongst the challenges they have faced with gentrification. While the process of re-making place is neither inherently good or bad, the social, economic, and cultural impacts of such landscape transformation deserves attention at the local scale. I argue that no matter the challenges a neighborhood may face, including those resulting from the process of gentrification, they can still adapt and learn from those changes over time.

**Abstract Code:** O6

**Presenter(s):**

Samantha Mills

**Faculty Mentor(s):**

Matthew Tornow

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Paleoenvironment of the Late Eocene Whitehead Creek Locality

**Abstract:** Toward the end of the Middle Eocene (40-37mya), the environment started to decline on a global scale. It was becoming more arid, the tropical forests were disappearing from the northern latitudes, and there was an increase in seasonality. Research of the Chadronian (37-33.7mya) in the Great Plains region has documented the persistence of several mammalian taxa, for example primates, that are otherwise extinct. This research aims to investigate the circumstances surrounding the persistence of these relict taxa (e.g. primates) in the Great Plains. More specifically, it seeks to interpret the environmental conditions that might have allowed these relicts to persist in the Great Plains after their extinctions elsewhere. The goal of this project is to better understand the community ecology at one fossil locality, the Whitehead Creek locality, Nebraska, for the purpose of reconstructing its paleoenvironment. To address the paleoenvironment at Whitehead Creek, I evaluated locomotor guilds of morphospecies, recognized through visual assessment and PCA, of 56 astragali and 43 calcanei. 54 terminal phalanges were evaluated morphometrically. Locomotor guild frequencies of small mammals (< 1,000g) for both Whitehead Creek and modern biomes were compared using both the Euclidean Distance method and Sørensen's similarity index. Results indicate that small mammals at Whitehead Creek practiced a wide range of locomotor activities including leaping, digging, climbing, and running in both arboreal and terrestrial habitats. Comparisons suggest that the environment at Whitehead Creek is different from all modern biomes but has a structure that's similar to a gallery forest from the Cerrado of Brazil. The mixture of locomotor categories found at Whitehead Creek suggest that I've got a mosaic of shallow, braided streams that're bordered by humid-subhumid "tropical" forests. These gallery forests are bordered by a narrow strip of seasonally-moist grassland. Open woodland forests border this narrow strip of seasonally-moist grassland.



**Abstract Code:** O7

**Presenter(s):**

Samantha Shobe, Curran Hansen, Smita Khobragade, Samantha Bromenshenkel, Jonathan Wong, Regina Lighthall, Muridatou Ibikounle, Briita Kinnunen, Holly Goodwin, Sagar Shahi

**Faculty Mentor(s):**

Sandrine Zerbib, Ann Finan, Amanda Hemmesch, Jim Cottrill, Monica Garcia-Perez

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Unleashed Opinions: SCSU 2019 student spring survey results

**Abstract:** The 2019 spring student survey, conducted by SCSU students between February 18 and February 22th, was designed to gauge at SCSU students' opinions on a variety of social and political issues that, for the most part, impact them directly in their everyday life. The presenters created the survey questionnaire and supervised telephone survey shifts in their role as student directors and lead student directors. For each substantial question they designed, they present their results in correlation with gender, class status, age, race/ethnicity and other demographic variables. Some of the results in this survey can be compared to other SCSU survey findings from previous years in which similar questions were asked, but can also be compared to other opinion polls' results. The themes explored in this spring student survey include: general sense about SCSU, safety on and off campus, SCSU college experience, president's performance, experience leaving in St. Cloud, and other social issues. We see our goal as the ability to provide empirical ground for reflection within our community, as well as potential improvements made within our academic institution.

**Abstract Code:** O8

**Presenter(s):**

Mohamed Kassim

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Stories of Success; Somali People in St. Cloud, Minnesota.

**Abstract:** Globalization is a powerful force that moves people around the world as economic migrants in search of better life. The purpose of this study is to show how some Somali individuals become successful in St. Cloud, Minnesota, a community with large presence of immigrants. I interview four individuals in the age bracket of 25-36 years and four additional individuals of between 50-60 years of age to understand how they define success. I expect my findings to be such factors as education, social capital and financial resources that makes Somali individuals to be successful.

**Abstract Code:** O9

**Presenter(s):**

Lydia Mbatidde, Arwa Hussain Chaiwala

**Faculty Mentor(s):**

Cathy Krier, Susan Petersen-Stejskal

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Using the drug pump delivery system to improve TB treatment outcomes of rifampicin and isoniazid

**Abstract:** The 2018 WHO global TB report shows global burden estimates of 10 million people who developed TB disease, with an estimate of 1.3 million death in 2017. Non-adherence to treatment remains a major obstacle to efficient tuberculosis control, (WHO September 2018), posing a great risk of increased multi-drug resistant TB. This device is meant to address the issue of non- adherence thus improving TB treatment outcomes. The project is developed in the USA MedTech Industry, to benefit the world TB population. The method involves using IsoMed Implantable Class III device to deliver parenteral Isoniazid and rifampicin (INH), to treat the continuation phase of TB Infection. Currently, the IsoMed infusion pump is indicated for the delivery of morphine via intrathecal space and intravascular space. Once the infusion pump is used among patient on isoniazid and rifampicin treatment, a titrated dose of the drug at the set time is automatically delivered to the patient thus eliminating barriers like timing and pill burden. This improves adherence and treatment compliance as well as improving the treatment outcomes. The Short-term Impact of this project is to set a student-led roll in the WHO global TB strategy, on innovative research with the use of MedTech devices in the management of infectious diseases in the developing world, as well as encouraging a global engagement of young leaders to join in with more ideas on how we can support the global TB population with more feasible ways of lessening disease burden while impacting a bigger population. In a long run, this will lead to an establishment of a long-term solution to improving TB treatment outcomes especially among people living with HIV through a device that can improve adherence and thus stepping down the global burden of TB.

**Abstract Code:** O10

**Presenter(s):**

Sydney Green, Ethan Her, Brandon Askin

**Faculty Mentor(s):**

Nancy Sundheim

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Real Life Application of Ergonomics

**Abstract:** Our senior capstone team is working with DCI Inc. to focus on the ergonomic analysis of the operators on the shop floor. We started by developing a project plan with milestones and determined an appropriate scope to accomplish over Fall and Spring semester. 64 common processes were identified, broken down, and delegated equally among each team member. Multiple visits to the company were necessary in order to observe the work flow and tasks being performed, as well as talking with the operators to gain useful knowledge about the process. The use of Rapid Entire Body Assessment (REBA) and Rapid Upper Limb Assessment (RULA) worksheets provided proper MSD scores to determine a process as low or high stress on the body. Processes with high ranking scores, potential for finding viable solutions, and ease of implementation at DCI were selected to focus on during Spring semester. If our suggested solutions are implemented it could improve productivity, increase worker well-being and happiness, and decrease injuries. The solutions will be presented to the company with all pertinent information in order for DCI to decide whether or not to implement a change in the facility. The end goal of our senior capstone project is working to improve production and employee well-being through ergonomic assessment, analysis, and process improvement.

**Abstract Code:** O11

**Presenter(s):**

Nichole Bredeson

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Second Citizenship: Transcending Into Global Citizen or Allocation of National Loyalty, An Exploration into Second Citizenship and Nationalism

**Abstract:** In response to an ever globalizing time the rise of nationalism is once again being vocalized around the world. Without respect and understanding for all sides involved these polarized viewpoints make discussion of critical economic, environmental, and political topics near impossible. In this project, the topic of global citizenship is explored by assessing attitudes and views of people who have had a change in citizenship with those who have remained with singular citizenship. Subjects include those who have switched nation of citizenship, hold secondary, or chose not to hold secondary when presented with the option, and some subjects who remain with singular citizenship. Those taking part in the study were colleagues, professors, and fellow associates of of the interviewer. Interviews were conducted to explore the rationale for the status of current citizenship, how daily life has been affected by that status, and opinions on current global and local topics. Experimental questionnaires were handed out as subjects were characterized into two groups, those holding second or who experienced a change in citizenship and those with unchanging singular citizenship. A global situation and national situation were presented to both groups. Following the short video situation a Likert survey was collected from each assessing the reactions and feelings of each group. This was used to differentiate between a more nationalistic sentiment versus those with a more globally impactful viewpoint. I expected to find that those holding second citizenship would express views showing global responsibility reflecting that of global citizen. I expected those who held a single citizenship to be more nationalistic in their views and responses. Challenges can be better approached when we are well informed and empathetic of viewpoints other than just our own. By exploring how citizenship influences a person's global loyalty we can reach a better understanding of globalism versus nationalism and start to the approach the conversation gap between the two.

**Abstract Code:** O12

**Presenter(s):**

Alex Maile

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Body Shape Changes Across Habitat Transitions in Lizardfishes (Aulopiformes)

**Abstract:** The lizardfishes and their allies (Aulopiformes, ~282 species) are investigated from a geometric morphometric approach to study the evolution of body shape changes across habitat transitions in this lineage of fishes. No previous studies have quantitatively examined changes in body shape across lizardfishes and their allies. Over 400 lizardfish specimens were digitized that included representatives from every family of these fishes. We identify that there are distinct patterns of body-shape change across the lizardfish radiation. Body shape trends of “cigar-shaped” are dominant in inshore and deep-sea benthic habitats while trends towards being elongated and a posterior position of the dorsal fin, reside in deep-sea lizardfishes (e.g. Alepisauridae, Lestidiidae, Notosudidae) with an exemption in Scopelarchidae, which exhibits a more cigar shape trend. This is the first study to document significant body shape changes across marine habitat transitions from coral reefs to the deep sea and has implications for the life history and biology of these fishes.

**Abstract Code:** O13

**Presenter(s):**

Mitchel Koebnick

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Reconstruction: Cynicism of the South

**Abstract:** When most people think of the United States after the Civil War, they believe that the era was defined by Lincoln who decided one day to free African Americans from bondage, and that both the north and the south harbored no ill will towards one another, and that the newly freed slaves integrated into society rather peacefully. This could not be farther from the truth as my oral presentation will prove that there was animosity from both sides after the war, with many in the north demanding that the struggling economy in the south pay for all the war damages, not to mention that they will be further hurt economically by losing their main source of labor. The southerners had the bitter taste of defeat in their mouths and were not told that their way of living was no longer acceptable. Newly freed blacks also had to live in a constant state of fear. Even as blacks attempted to give themselves an education, groups like the Ku Klux Klan drove terror into the hearts of many people, and not just blacks, but their sympathizers as well, such as their educators. One common misconception is that women in the early 20th century started their campaign towards equal rights. Yet women were starting to make progress towards the right to vote during the era of reconstruction.

**Abstract Code:** O14

**Presenter(s):**

Ian Reischl

**Faculty Mentor(s):**

Gareth John, David Wall

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Iron and Gold, Boom and Bust: A Comparative Geography of Minnesotan and Californian Ghost Towns

**Abstract:** When picturing what a “ghost town” is, the stereotypical image is of an old Western boom town turned bust, with dilapidated wooden buildings and false fronts. However, not all ghost towns are the same. Each region has its own peculiarities when it comes to things such as economy and culture, so I believe the specificity of the causes for these towns' decline and the patterns in which they declined will be specific to the region. An area with a high prevalence of ghost towns that is not talked about nearly as much as the West is the Iron Range in northern Minnesota. Using archival materials, from resources such as the Minnesota State Archives, this thesis investigates why ghost towns on Minnesota's Iron Range declined, how they declined, and how their lands are being managed today. It will also look at how the trends that result from these questions differ from those present in ghost towns in other regions, such as those in California's Sierra Nevada, highlighting the peculiarities and unique qualities of the Iron Range.



**Abstract Code:** O15

**Presenter(s):**

Lucillia DiCenso

**Faculty Mentor(s):**

Robbie Mann

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Cognitive and Physical Relations in Primates

**Abstract:** A compelling look into the world of primate cognition and capacity for learned behaviors and abilities. By looking at the socialization and social behavior, as well as physical structure of the skull, a conclusion will be made on non-human primates to see whether they are able to begin the process for further evolution. As well as that, it will be studied how dentition and food choice can impact a social structure and increase both physical and behavioral changes. I will begin by further looking at evolutionary processes, as well as the split from chimpanzee and early primates, to bipedal hominids and Australopithecus. Then, moving forward into time, I will examine the skeletal structure, skull capacity, and dentition to determine how cognitive decisions were made, as well as evolving to learned behaviors. I will also involve a short study into Jane Goodall's work, and how it may have impacted her own findings. In present time, I will be studying how social structure and learning from others may impact the future of evolutionary time. Because of the nature of my studies, I will have a full length paper available to those who wish to learn more about the topic, and will give a brief overview of my findings. It will include a PowerPoint presentation, and the paper handout, as well as hand-drawn illustrations of specimens included in the presentation. There may be casts to hand around for demonstration.

**Abstract Code:** O16

**Presenter(s):**

Kayla Justice

**Faculty Mentor(s):**

Maria Mikolchak

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Consumption and the 19th Century Novel of Female Adultery

**Abstract:** Consumption comes in many forms. Often, when we hear the word consumption we think of food and drink first, of a gluttonous lifestyle. However, consumption in the 19th century novel of female adultery is not limited to the consumption of food and drink (in fact, often food is promised but never enjoyed, as in a dream); rather, consumption becomes an encompassing term for material goods, romance (forbidden or otherwise), and literature or poetry. Gustave Flaubert's *Madame Bovary*, published in France in 1856, describes the extravagantly empty life of Emma Bovary. An early example of the literary realism tradition, the novel explores in acute detail the banalities of provincial life as experienced by Emma, who remains chronically insatiable in terms of her material wealth, her romantic pursuits, and her lust for literature. Leo Tolstoy's *Anna Karenina*, published in Russia in 1878, similarly engages with such carnal desires, exploring consumptions that extend beyond food and drink into the passions of forbidden love. Lastly, Theodor Fontane's *Effi Briest*, published in Germany in 1895, deals with similar immaterial consumptions – those of the mind. The trends of material and immaterial forms of consumption in these three great continental European novels of female adultery provide an opportunity for comparison. Thus, this paper will examine the role consumption, in its various forms, simultaneously takes shape in and shapes the experiences of the female protagonists in *Madame Bovary*, *Anna Karenina*, and *Effi Briest*.

**Abstract Code:** O17

**Presenter(s):**

Deepthi Paritala, Danard E. Higgs

**Faculty Mentor(s):**

Hiral A. Sha

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Re-layout of a Teardown Line At A Medical Device Manufacturing Company

**Abstract:** Dis-assembling Product A in teardown line at a medical device manufacturing company was required because of defects in Product A. The process involved labelling of Product A components, dis-assembling the components, detecting the defect through a visual inspection. All these processes were done sequentially and the time taken for the process depended on each and every individual depending on their experiences and background. The components to be disassembled were collected from the insertion area, clean room area, packaging area, shipping area and returned products from customers. After the completion of the process all components were associated with the documentation and were moved to appropriate areas-scrap, stores, etc. The physical layout of the process was complex due to which the time requirements were getting compromised. The purpose of the project was to re-layout the structure so as to meet the satisfactory lead-time, reduce error rates, improve client satisfaction by fulfilling 90% of client's requests per day. The results obtained from this project will be discussed at the oral presentation.

**Abstract Code:** O18

**Presenter(s):**

Sanjeev Regmi, Bijaya Ghorasainee

**Faculty Mentor(s):**

John E. Sinko

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Study of Zinc Oxide Nanoparticles

**Abstract:** The goal of this project is to create nanoparticles out of zinc oxide for a quantum process to convert light to a different color. This project will use an infrared Nd:YAG laser to ablate zinc samples immersed in water in a liquid cell. A XY scale spindle is used to differ the location and increase the number of laser spots ablated in the target, to obtain as much as sample of metal oxide nanoparticle. The ablated zinc chemically reacts with water to produce zinc oxide nanoparticles. Then the nanoparticles samples will be collected by a drying process. The obtained zinc oxide nanoparticles will undergo analysis using DLS (dynamic light scattering) method. In this method, a low power laser beam is passed through the sample and the variations in transmission are used to infer the average particles size distribution between 0.1-10000 nanometers. Our goal is to achieve nanoparticles less than 6 nanometers diameter. The collected samples will be compared with the theoretical predictions and be forwarded to Dr. Nelson's collaborator for photonic analysis. The external collaborator will also provide assessment by optically analyzing the nanoparticles with ultrafast lasers to see if they produce the desired color change on the basis of quantum mechanics theory.

**Abstract Code:** O19

**Presenter(s):**

Nathan Stanek

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Myths Dispelled of Immigration and Emigration in the U.S.

**Abstract:** I want to focus my topic on immigration and the displacement of Native Americans, Chinese peoples, and Hispanic peoples in the U.S. Many people learn about manifest destiny in school and do not realize that land was not peacefully given to European American settlers. I also want to disprove the notion that all people in the late 1800s were racist and against immigration. Many people voted against anti-immigration measures and were incensed by the rhetoric coming from people who did not like immigration. Many minority groups are mischaracterized by many histories people learn about. I want to show that Hispanic and Native Americans fought to keep their lands when European American settlers moved in. I would also like to tell about the many Hispanic settlers who both fought against and with European Americans when their land was threatened by European Americans. And I want to disprove the notion that Native Americans were always defeated when challenged by European settlers. Asian immigration is also too simplified in the Chinese Exclusion Act. I want to show that in many cases Chinese people and American people were both for and against Chinese immigration to the U.S. in the late 1800s.

**Abstract Code:** O20

**Presenter(s):**

Bijaya Guragain, Elisha Shrestha

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Digital Banking Crime

**Abstract:** This project is about digital banking crime.

**Abstract Code:** O21

**Presenter(s):**

Palaha Joshi, Arwa Hussain Chaiwala

**Faculty Mentor(s):**

Hiral Shah

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Lab-on-Chip Technology for Screening and Diagnosis of Oral Cancer

**Abstract:** Head and neck cancers constitute the sixth most common cancer worldwide out of which 40% are squamous cell carcinoma of oral cavity. Despite therapeutic and diagnostic advances, the 5-year survival rate for Oral Squamous Cell Carcinoma (OSCC) remains at about 50%. OSCC is a disfiguring and deadly cancer. No accurate, cost-efficient, and reproducible method exists to screen patients for OSCC. As a result, many patients are diagnosed at advanced stages of the disease. Current diagnostic techniques for OSCC require modern laboratory facilities, sophisticated equipment, and elaborate and lengthy processing by skilled personnel. The lab on chip technology combines both the biomarker and micro fluids technology and holds the promise of replacing the old techniques with miniaturized, integrated, automated, inexpensive diagnostic devices. This goal of this project was to study this technique to utilize in identification of oral cancer. The technology based on biomarker-based identification is a non-invasive method for the detection of the of premalignant and malignant lesions of the oral cavity. It requires easy access and readily available source of cancer cells and fortunately oral cavity meet both these criteria. Saliva from the oral cavity, because of its cellular composition, accessibility, and inexpensive and noninvasive methods of collection, is ideal as a diagnostic medium for oral cancer detection. It thus forms the basis for lab on chip technology for early screening and diagnosis of OSCC thereby improving the prognosis and long-term survival. Additionally, it will provide a means for cancer typing, staging, monitoring, reoccurrence and assessment of the effectiveness of therapies, and detecting drug resistance.

**Abstract Code:** O22

**Presenter(s):**

May Vang

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Globalization Effects of Social Media on Hmong Teenagers in the Twin Cities Metro Area of Minnesota

**Abstract:** As technology becomes more advanced, there has been an increase in its use to be globally connected to the world. Advancements in social media technology have a great impact on teenagers and how they connect with the world. As migrants and refugees, Hmong people of Southeast Asia have slowly assimilated in the United States. This study analyses how social media affects specifically Hmong teenagers, particularly in the Twin Cities metro area of Minnesota. Social media usage by Hmong teenagers is compared to how Hmong millennials once used social media in their teen years a decade ago. The study further describes how Hmong teenagers are personally affected by the social media, whether in a positive or a negative way. The methods used in this study include in-depth personal interviews with seven Hmong teenagers and seven millennials, as well as electronic surveys of additional people to gather data. The finding from this study is that Hmong teenagers in Minnesota in 2019 are more globally connected to the world as opposed to those from a decade ago, which in turn might lead to a greater civic engagement.



**Abstract Code:** O23

**Presenter(s):**

Joseph Nagel, Sarah Miller

**Faculty Mentor(s):**

Cynthia Fitzthum

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** United States Civics / Government Curriculum

**Abstract:** This project consists of a U.S. Government/Civics curriculum designed for a 12th grade classroom. The curriculum was designed to address the most important and useful concepts that students need to learn in the modern day. This curriculum consists of lesson plans for 1 standard semester and supplemental materials. This U.S. Government/Civics curriculum goes beyond all of the standardized requirements set forth by the state of Minnesota. Besides Civics standards, this project dives into standards for Economics and History. The reason that the curriculum was designed to cover standards that fall outside the required Civics standards is because Civics is considered a social science, which should be studied with a multidisciplinary approach. Designing this curriculum with a multidisciplinary approach is what makes it unique. The curriculum addresses Economic standards throughout the Federal Reserve unit. The Federal Reserve unit was created for students to understand how civic leaders and individuals guide and monitor the nation's economy. History standards are addressed in the first couple of units of the curriculum. History standards were addressed because it is vital that students understand how the governing documents of this nation were developed and implemented. It is important that Civics, or an social science, is approached with a multidisciplinary approach. This curriculum makes the the best attempt possible at making the multidisciplinary approach.

**Abstract Code:** O24

**Presenter(s):**

Andrea Langhoff, Jenevieve Jaax

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Beyond Suffrage; Women of the Progressive Era

**Abstract:** Many textbooks and history lessons highlight women’s suffrage as the epitome of women’s rights of the Progressive Era. While the right for American women to vote is indeed something to be celebrated, women of the era fought for much more than the chance to cast a ballot. The Progressive Era was known for extensive social activism, and suffrage was not the only thing progressive leaders were seeking to accomplish for women. Margaret Sanger was an activist who worked towards the legalization of birth control. Mary Church Terrell was a civil rights leader who was among the first African-American women to serve on a school board and was a charter member of the National Association for the Advancement of Colored People (NAACP). The Seneca Falls Convention had 11 resolutions about women’s equality in the home, church and society; with only one of those resolutions specifically about the right to vote. Women worked for access to education, better working conditions, freedom from the institution of marriage, and racial equality. This presentation will broaden the narrative of the fight for women’s rights during the late 1800s through the early 1900s to go beyond suffrage and the 19th Amendment. Everyday historians should know more names other than Susan B. Anthony and have a greater appreciation for the role of women in America’s early social justice movements.

**Abstract Code:** O25

**Presenter(s):**

Alyssa Mussehl, Amber Wieberdink

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Tri-CAP Client Survey

**Abstract:** One of the biggest questions in society today is “How can we help people better themselves and be able to support themselves?” Tri-CAP is an organization that is focused on this exact goal and they have asked us to design a survey that targets the reasons that people cannot support themselves and what services they could provide that might help. We were also asked to analyze the data from the surveys we created and figure what areas needed the most help and what kind of help that was as well as figuring out where Tri-CAP has done a good job supporting the community they serve. The specific question they have for us is where the gaps in their services are and areas that can either be changed or created in order to help the community they serve. Our specific survey was designed to go out to the clients of Tri-CAP, meaning the people who already use services provided by them. From the clients specifically they want to know where they are struggling the most as well as demographic information to understand who their clientele is better. Tri-CAP was also curious about what services each individual already uses in correlation with what their biggest needs are. The surveys were sent out both electronically and some paper copies were handed out to clients as well to try to get the most well-rounded sample possible.

**Abstract Code:** O26

**Presenter(s):**

Madellen Schetnan

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Brexit Impact on Veganism

**Abstract:** Prior to Brexit, the UK could eat food from all around the world. 50 percent of their food is homegrown while a whopping 30 percent comes from EU countries and a collective 16 percent from Africa, the Americas and Asia. Leaving the EU means that a huge proportion of their shopping is no longer available. What can this mean for the short run? It is likely that the UK will experience some shortages as more than half of the bacon sold in the United Kingdom comes from Germany, Denmark, the Netherlands and Italy, as do 43% of all pork products. A LSE (London School of Economics) report from last summer suggests that dairy will become a luxury product once Brexit is completed. I am very interested in looking more into this and figuring out what will happen in the immediate short run and later on in the long run. Rising prices of meat and dairy due to various market regulations and tariffs will be easy to relate to economics and is obviously directly correlated to United Kingdom leaving the European Union. I feel as if this is a special topic that not many people will know much about; I hope to find more and more information pertaining to this topic as there were many more articles than I expected on the effect of Brexit with veganism. I also plan to speak with locals while traveling over the duration of this trip to see if they have any strong opinions on this matter, along with doing some of my own research within the places we visit.

**Abstract Code:** O27

**Presenter(s):**

Karen Ciesielczyk, Raelynn Satterlee

**Faculty Mentor(s):**

G.N. Rangamani

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Lexical Access in Select Group of Bilingual Speakers

**Abstract:** As Speech-Language Therapists, we will be working with diverse populations when evaluating, diagnosing, and treating people with a variety of communication disorders. One of those disorders is aphasia. According to Threats and Worrall (2004), “Aphasia is an acquired neurogenic language disorder resulting from an injury to the brain”. Persons with aphasia (PWA) have difficulty speaking, understanding spoken language, reading, and writing. Aphasia limits the PWA’s ability to communicate and participate in day-to-day activities socially, emotionally, vocationally, etc. and compromises their quality of life. Timely and effective interventions of aphasia are crucial. Through our graduate education, we have learned about the importance of normative data to accurately assess and diagnose communication disorders. Unfortunately, most normative data used to diagnose aphasia is based on monolingual English speakers with paucity of normative data in bilingual populations. Our research aims to add normative data to the existing bilingual database and further the understanding of language use in bilingual speakers. Understanding the language processes in relation to proficiency and use of languages in bilinguals are critical to differentiate damage effects from language attrition (loss of skills due to disuse). We examined how typical bilingual speakers performed on various language tasks that are used in the aphasia assessment. Our study consisted of Minnesota residents whose first language (L1) was Tamil and who spoke English as their second language (L2). After analyzing how they performed on the various language tasks, cultural norms and geographical factors appear to play a significant role in the differences in the participants’ semantic access (how individuals are able to access the meaning of a word in a given language) and naming functions. Our study reiterates that understanding the semantic-lexical access of bilingual speakers from various language groups are crucial, especially when normative data are used in clinical assessments of bilingual speakers. Threats, T., & Worrall, L. (2004). Classifying communication disability using the ICF. *Advances in Speech Language Pathology*, 6, 53-62.

**Abstract Code:** O28

**Presenter(s):**

Ashley Creps

**Faculty Mentor(s):**

Andrew Anda

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Web Accessibility: an Introduction

**Abstract:** While the Internet has been a great boon to society, much of it is still inaccessible to those with disabilities. Even the government and public websites of various EU countries fail to comply with industry-standard guidelines, and private websites are often worse. These industry-standard guidelines are created by third party organizations, the most prominent of which is the World Wide Web Consortium. Their current standards, the Web Content Accessibility Guidelines 2.0, are referenced by the International Organization for Standardization, the European Commission, and the United States government. The WCAG 2.0 has several components, the first of which are four principles that describe accessibility: perceivable, operable, understandable, and robust. Categorized under these principles are twelve guidelines, as they specify the requirements that would pertain to those traits. To measure successful compliance, websites must meet the respective requirements to be classified at a certain level. The lowest level is A, and the higher levels AA and AAA are attained when further requirements are met on top of the lower level ones. One of the biggest challenges in implementing accessibility is evaluating a website for its compliance. WCAG 2.0 provides a few tools, known as techniques and failures. Techniques are recommended implementations or improvements, whereas failures mark specific instances of inaccessible content. Even content as basic as images, headers, and hyperlinks have standards they must adhere to. For content like this, amateur designers can use simple third party tools to evaluate them manually. For professional productions, however, a more involved and automated process is necessary. An example of such a process would be the developers evaluating OCW websites, where they used a modified WCAG-EM 1.0 for the purposes of streamlining both the automated and manual testing.

**Abstract Code:** O29

**Presenter(s):**

Brandon King

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Preparation and Communication of International Students at St. Cloud State University to Cultural Lifestyle in St. Cloud, MN

**Abstract:** There has never been borders when it comes to knowledge and education. Finding the most convenient methods for everyone around the world to be educated has always been a global goal. One of these ways has been international studies. St. Cloud State University has had international partnerships with over 90 countries in the world. Countries of different culture and lifestyle including climate, food, transportation, and communication. My presentation has addressed how communication, from international student's native culture to the culture they came to, determined the student's transition to Minnesota lifestyle. This was done gathering information from the Center of International Students and using methods of interviews, observation, and surveys from international students that came from the top three countries that St. Cloud State University welcomes. In conclusion this project will answer how prepared international students are when coming to St. Cloud State University, what preparations of adaptation and integration are provided from St. Cloud State University, and the transition of international students to St. Cloud State University.

**Abstract Code:** O30

**Presenter(s):**

Debrah Doboyou

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Comparing the Relationship Between First Generation of Young Adult Refugees from West Africa and Their Parents and Young Adult in America and Their Parent

**Abstract:** It is a known fact that first generation young adult refugees and their parents have a different family relationship compared to American young adults and their parents, but it is not well studied. I believe that It's very important to conduct a more thorough research that shows how young adults from both backgrounds deal with issues such as education, social life, work life and health. According to literature, one of the reasons that there is a persistent divide between refugee children and their parents is that young adults become Americanized while their parents are still holding on to their beliefs which causes a rift. I conducted a written survey with students and faculty members in St. Cloud/ Brooklyn Park area of West African descent. I found that American families generally have better communication within the family than West African families and I provide some tips how this can be improved.



**Abstract Code:** O31

**Presenter(s):**

Frida Alvarez

**Faculty Mentor(s):**

Jiping Zuo

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** How Racism, Colorism and Proximity to Whiteness is Perceived and Acted Upon in Latinx Communities

**Abstract:** When we think about whiteness and its effects, who do we think about? Often Latinxs are left out of the conversation. What the larger audience outside of Latinidad fail to understand is that Latinxs can be Black, Native, White, Asian, Mixed, etc. Regularly, Latinos are thought of as people of color—within the system of racism, meaning that they cannot be racist, but be prejudiced since they lack the power (whiteness) to actually be racist. However, racist ideology permeates Latino culture from phrases like "mejorar la raza" ("better the race" by marrying a white or lighter skin Latinx) to anti-Black policies that have been lead in the Dominican Republic. So, this begs the question how does whiteness influence Latinx communities? How do Latinxs understand themselves in the context of Latinidad and whiteness? It is imperative to enlighten ourselves about how whiteness is formed and sustained in black, indigenous and other communities of color. White supremacy and the ideology of whiteness not only rely on white people but use other marginalized communities to uphold the status quo. Through circumstances like colorism, this affects how communities interact with one another. It's where phrases like "pelo malo" (bad hair towards afro-Latinas) are bred and perpetuate similar racial injustice as we see in the United States. Chavez-Duenfias, N., Adames, H., & Organista, K. (2014) argue that the use of a pan-ethnic label such as Latino/a erases the marginalized voices of the Black and Indigenous peoples of Latin America. The goal is to understand whiteness in Latinx communities. How do Latinxs understand their race in the context of Latinidad? How do Latinxs uphold white ideology and white supremacy within their own communities? Is a first generation Latinx-American more likely to carry on those ideologies or are they likely to challenge those ideas versus a second, third, or fourth generation Latinx-American. What are the similarities and differences between Latin American and United States culture in the way they approach and understand race? How are health outcomes, occupational status, and representation affected by racism and colorism within the Latinx community? It is important to tackle the various aspects of racism and colorism to observe how the manifest in beauty, media, occupational status, income and many other factors. Since there is little research done on this particular topic, it is no surprise that there are massive gaps in research. A major gap in research has been the absence of Afro and Indigenous voices, so I will be putting major emphasis on reaching individuals who identify within those groups. The three main goals of this research project are to understand colorism and racism in Latinx communities and learning how racism and colorism intertwine to affect life outcomes, self-perception and community identity/perception of community. It is critical to understand this because

most research has focused on white or light skinned Latinx populations which have a very different perception and experience of Latinidad than to darker skinned, Black and Indigenous Latinxs. However, by taking to account prior research I have found it imperative to focus on how colorism and racism are embedded in Latinx communities and how that affects the life outcomes and identity of community as a whole. By assessing community identity, life outcomes and self-perception based on colorism and racism in Latinx communities we can start to bridge gaps found in previous research. A generational comparison would also be imperative as immigration from a Latinx country to the United States may reshape how one perceives their racial make-up.

**Abstract Code:** O32

**Presenter(s):**

Andrew Olson, Mihret Tefesse, Sultan Al Hataylah, Bryce Smith

**Faculty Mentor(s):**

Jeongmin Byun, John Mirth

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** LTX 3000 Improvement

**Abstract:** This presentation will showcase the LTX 3000 and the improvements made by our senior design team. The LTX 3000 is a chair for individuals who suffer from lower lumbar pain. By using gravity traction the LTX 3000 holds the users upper body in place while allowing the bottom half to be lowered. This process uses the individual's own body weight to take pressure off of the spine allowing the disks within the spine to decompress, and in some cases, re-align the disks into the spine. Our senior design team was tasked with reviewing the LTX 3000 in its current form and make adjustments to the operation of the chair based of user feedback and an engineering point of view. We will detail some of the user issues and share areas where improvement was needed. Design methods will be discussed as well as our decision making methods. We will outline our final prototype and dive into the technical side of the operation. This will demonstrate the skills, and understanding of those skills, that we have learned at St. Cloud State University while on our paths to graduation.

**Abstract Code:** O33

**Presenter(s):**

Jie Xin Gooi

**Faculty Mentor(s):**

Sarah Campbell-Sengupta

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Omni-Channel Options: What Consumers Really Want

**Abstract:** Delivery options are changing rapidly and almost every day. How do we gauge its growth and determine truly successful delivery systems with Omni channel technology? And how do we measure how much that growth affects consumer and their behavior? With technology enabled-systems comes efficiency within the business world and innovation in delivery systems in respective industries. One of the greatest example for the supply chain is the radio frequency identification (RFID), and how the RFID helps increase the opportunities for effective and efficient traceability system and how it helps to reduce labor costs and the business process. RFID technology has been used for different range of operations from access control systems to airport baggage handling, livestock management system, automated toll collection systems, theft-prevention systems, electronic payment systems and automated production system (Mathews, 2015). The main objective of this project is to see how customer purchase platforms are influenced by delivery options available and how platforms can choose the best delivery options that reflects customer behaviors . Such options include home delivery, parking lot pick-up, and drone delivery. We analyze what is not being properly addressed by the industry: How do consumers feel about Omni-channel technology integrated in delivery systems? What impacts buyer behavior and efficiencies in consumer logistics? And which delivery systems work best overall? The project will be organized into few different sections, begin by the conceptual background, literature reviews, the current product delivery technology in the market, the research we found and followed by a more detailed discussion of the findings and conclusion.

**Abstract Code:** O34

**Presenter(s):**

Quincy Kesti, Matthew Byman, Dan Alfveby, Nyia Xiong

**Faculty Mentor(s):**

Steven Covey

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** 3M Hose Card Project

**Abstract:** The project consists of building a machine to automate an assembly process. The criteria for the project are to meet a specific cycle time, to keep the project within a budget, and to produce deliverables including a functioning and verified device, an instruction manual, and all the engineering work created in the process of designing the device. This project requires a time commitment of at least 10 hours per week per team member, for an estimated total of 1280 hours over the course of 1 academic year. This project requires team members to apply knowledge and skills from the engineering program, as well as from personal experience, to successfully design the device. The project also requires team members to experience real-world applications of engineering, too.

**Abstract Code:** O35

**Presenter(s):**

Mohammed AlHasan, Jordan Kleinschmidt, Travis Swanson

**Faculty Mentor(s):**

Steven Covey

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Retractable Bicycle Tire Stud

**Abstract:** Most bike studs on the market today offer a simple means to provide traction in icy winter weather. However, these studs can wear easily due to abrasive pavement as well as increasing road noise and rolling resistance. Our goal is to design a bicycle stud that retracts when on hard surfaces that cause wear, yet still provide excellent traction on icy surfaces when needed. In doing so, we wish to create stud support system housing that requires no user input, is more durable, and is cost effective. In accomplishing this goal, extensive research and experimentation were necessary to determine the force required to plough through ice. Several design concepts were evaluated to determine the optimal design for manufacturing. Each design concept utilizes a non-linear spring-like behavior to maintain high traction and maximize the lifespan of a regular tire stud. The project relies heavily on polymer material data research to produce these non-linear forces. The studs will then be produced with the new stud support system concept that allows retraction and integrated into studdable bicycle tires. Our ultimate plan is to sell the intellectual property to a company who can integrate this technology into their manufacturing processes for consumer use as soon as next winter, 2019.

**Abstract Code:** O36

**Presenter(s):**

Jeremy Smith, John Thomalla, Jeremy Plough, Nick Tillmann

**Faculty Mentor(s):**

Eric Little

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Independent Vacuum Pod

**Abstract:** The team is developing a new vacuum pod that has no external connections and remotely controlled by the operator. Technology going to be utilized by Park Industries to decrease machine set-up time, and increase machine productivity.

**Abstract Code:** O37

**Presenter(s):**

Scott Stellick, Nawaf Algeaan, Zhenxing Shi, Saksham Poudel

**Faculty Mentor(s):**

Eric Little

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Car Lumbar Relief System

**Abstract:** Our senior design team has been assigned an issue from a client and we are required to apply our developed knowledge of mechanical engineering to create a solution to the problem. The key issue being addressed by this project is the discomfort of the back while driving a vehicle, especially for those with recurring or chronic back pain. This discomfort is primarily derived from the compression of the discs in the lumbar region. The project has developed to be a design for a seat cover which incorporates an adjustable lumbar relief in the users back. This focuses on the decompression of the discs to create a relief of pain. A mechanism in the seat cover will be used to create a lumbar distraction and it will hold and lift the users torso to create the relief in their discs. The mechanism includes a vertical lifting lead screw that will be adjusted by the user for their desired level of displacement. Taking into consideration customer requirements, cost and ease of production, material weight and integrity there have been many alterations. We are prepared to discuss how the design has been determined and what testing has been done and needs to be done still. However, through the engineering process, the design for a prototype is making headway and will be completed for the end of the semester.



**Abstract Code:** O38

**Presenter(s):**

LeeHong Ho, Li Dai

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Global Positioning System (GPS) device forensics

**Abstract:** This project is conducted for Information Assurance (IA) 681 (Digital Forensics and Investigation) course. As part of the learning lessons in forensic class, students are encouraged to apply the skills and knowledge acquired from class. Thus, this project will focus on how digital forensics can be used to acquire deleted data from a Global Positioning System (GPS) device that is not supported by a vendor that provides navigation mapping or services. The reason for selecting a GPS device that is not supported by a vendor is that vendors can retrieve the data from the company server even though the data is deleted from the GPS device. The GPS device used in this project can be a navigation application in a mobile phone or GPS navigation device such as Garmin or another brand. The focus of this project is to demonstrate the technical aspect on how we can trace or recover deleted data from a GPS device using tools that can be commercial or free software used in the forensic industry. Thus, the work performed here can be used as a baseline for individuals who are interested in forensics, legal investigators, and other research students to further build on this baseline and contribute to the research community.

**Abstract Code:** O39

**Presenter(s):**

Scott Schmidt, Elizabeth Adelowo, Sujan Pandit

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Network Forensics

**Abstract:** Due to time constraints, a summary has not been created yet but will soon in conjunction of coordination with IA681 course objectives.

**Abstract Code:** O40

**Presenter(s):**

Arbaz Siddique, Rami Al-Salihi

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Digital Forensics Case - Missing Teenagers

**Abstract:** we will make a case about missing teenagers and provide a few clues on what might have or have not happened to them

**Abstract Code:** O41

**Presenter(s):**

Emerald Simkhada, Ayauly Seikhan

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Drug/ Narcotics Crime Investigation Case Work

**Abstract:** Its about a drug/narcotics case work for IA 681 class that we will be presenting. We have not yet got a chance to talk about it but it will be a investigation casework designed.

**Abstract Code:** O42

**Presenter(s):**

Emma Hanegraaf, Alexis Lund, Brittany Sturges, Amy Smith

**Faculty Mentor(s):**

Ahmet Sezen

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Machine Design for Engineering Capstone Experience

**Abstract:** For our senior capstone project within the Mechanical and Manufacturing Engineering Department here at St. Cloud State University we have been sponsored by a company to design, build, and test a machine to partially automate one of their current sub-assemblies. The existing process is relatively labor intensive and time consuming which requires excess inventory buildup. The machine built by our design team will not fully automate the assembly, but instead, have an operator placing all the components together on a fixture that will be fed into an automated spot-welding station. The completion of the machine will allow for greater staffing flexibility while speeding up the manufacturing process to bring the entire assembly closer to single part flow. Over the past few months, our team has been fully engulfed in the design process starting with brainstorming and prototyping to nail down ideas. With a completed idea in mind, building and programming of the machine was underway. To finish up our capstone project, the assemblies produced by our machine will be tested to verify they meet the current standards. We have been putting our education to the test with this project and have faced challenges we didn't even know existed. In a few short months we will be entering the work force with full confidence upon completion of this machine design.

**Abstract Code:** O43

**Presenter(s):**

Steven Kamm, Nigel Hearn

**Faculty Mentor(s):**

Yi Zheng, Ling Hou

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Broadband Bioimpedance Analysis

**Abstract:** Bioimpedance analysis is widely used in the medical industry for measurement devices. As the frequency of the excitation signal changes, so does the response of the bio-material. Because of this, there is a need for a device which is capable of delivering small, controlled electrical excitations at a broad range of frequencies. Our system is designed to send and receive excitations with a frequency range of 1Hz -- 1MHz through an external bio-material, with the goal of measuring the impedance of the bio-material. This system is centered around a ZYNQ-7000 series integrated circuit, which contains both a Field Programmable Gate Array (FPGA), and an ARM based microcontroller. Additional components include a 12-bit Digital to Analog converter (DAC), and two 16-bit Analog to Digital converters (ADCs), and various circuitry to condition and filter the signals for measurement. Finally, a C# Graphical User Interface (GUI) is used to control the overall system operation, and to use the measured data for calculating the impedance of the bio-material. This project is a continuation of a previous thesis project, with the main focus's being improving the signal integrity, various software improvements, and calibrating the device using a known impedance circuit. This project is sponsored by Born Fuke Medical Devices LTD.

**Abstract Code:** O44

**Presenter(s):**

Christopher Anderson, Shawn Anderson, Peter Palecek, Raaed Bamadhan

**Faculty Mentor(s):**

Jeongmin Byun, John Sinko

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Three-Dimensional Laser Positioning System

**Abstract:** The project is a laser table positioning system. This is for a laser table which will be used in student and faculty research, laser welding and cutting, and potentially marketing. The system must be able to move along three different axes within a specified tolerance. There is also a minimum size that the table must be able to cut into. There were four solution ideas which were considered. The first one involved the table moving along x and z axes and the laser lens assembly moving along the y axis. The second idea involved the laser lens assembly moving along the x and y axis and the table only moving along the z axis with a set screw. This would be difficult to implement because the laser would have to move as well, and it is heavy. The third idea involved moving the laser lens assembly in all three directions; however, that would involve a lot of mirrors to make that work. The fourth and final idea involved moving the table in all three directions. The idea chosen was the first idea because of it is relatively simple and it is less expensive than the other ideas.

**Abstract Code:** O45

**Presenter(s):**

Michael Knight, Amanda Strom

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Policies and Acts on the Home Front 1900-1920

**Abstract:** When you think of the the early 1900s era many people think of World War 1 but there were many policies on the home front that did not affect the war at all, one of the things you think of is the National Parks system and while the creation of these was great parks was a positive for the United States the negative aspect is missed from this. Where did Roosevelt get all of this land to make the national parks? After doing research it shows that they took this land from Native American tribes so while what the land was used for may have been good there was also the negative of how we got the land. There were also many policies that benefitted the economy of the United States, these were enacted by several of the presidents of the era such as Theodore Roosevelt, William Howard Taft, and Woodrow Wilson. My research shows that all of these administrations kept the doors open to trade with other nations which by the end of the war led the United States to become the largest creditor in the world. These things led to ups and downs on the home front for the United States that can be credited to the success of the United States during the World War One era.



**Abstract Code:** O46

**Presenter(s):**

Jackie Kasper

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Perspectives of the Progressive Era

**Abstract:** Perspectives of the Progressive EraThe Progressive era of the United States is often defined by the processes of industrialization, urbanization, and immigration. Many Americans today fail to see the extent to which these three processes are connected. In this presentation, I will demonstrate the interwoven relationship between industrialization, urbanization, and immigration. In order to do so, I will be using multiple sources including first hand accounts from Progressive Era and secondary analysis from modern day historians. Some of the groups that I will be focusing on include: immigrants from southern and eastern Europe, wealthy business owners such as Andrew Carnegie, and union organizations like the Knights of Labor. I will also be using political perspectives and social movements such as nativism and the labor movement. One of my goals is to show the complexity of this Era. I wish to show how different perspectives clashed with one another and created tension between various groups. Two of the biggest causes of conflict were the the United States' relationship with immigrants and the gap between rich and poor. I will use the conflicts between groups to show how they affected industrialization, urbanization, and immigration.

**Abstract Code:** O47

**Presenter(s):**

Chase Anderson

**Faculty Mentor(s):**

Robert Galle

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Great Depression: How Experiences Differ

**Abstract:** When people think of the Great Depression in the 1930s, many people picture long bread lines full of homeless, jobless people. They picture suffering and hopelessness that affected everyone from farmers in the Great Plains, city dwellers, and members of all socioeconomic statuses. In this presentation, I want to offer a new view of the Great Depression. I will present different accounts from people who both lived during the Great Depression and those whose lives were indirectly impacted to show how not everyone was in “bread line1 wearing a permanent frown on their face. Accounts like Emma Tiller’s, an African American cook in western Texas who would try and give help to whoever came her way, Cesar Chavez, whose family traveled all across the southwestern United States following the harvest to get work where they could, and a car dealer who was in and out of the Civilian Conservation Corps, the CCC, just to make enough money to live on, who tell stories of suffering and hardship. After, I will explain some accounts of people who were not affected as greatly, if at all by the Depression, people like William Benton, an advertising agent whose income doubled every year during the Depression, or Sidney Weinberg, an investment banker who was not negatively affected. The purpose of this presentation is to expose the different experiences during the Great Depression and to show that not all of America were affected equally.

**Abstract Code:** O48

**Presenter(s):**

Holly Johnson

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** A Re-examination of Past Politics, 1877 to 1900

**Abstract:** Many believe that the politics of the past were basic and easy. That there were no big controversies and politicians were kind to each other. We believe that what has happened the past decade of politics has been the most controversial and influential time in history. Yet politics between 1877 to 1900 brought up many controversies, and ended with the United States debuting as a major power on the world stage. Early democrats and republicans were different from how they are today, but they still feuded with each other. The Dirty Election of 1884 is an example of this, and was considered one of the dirtiest elections in American history due to the nature of candidates and how they treated each other. Concepts such as Jim Crow politics were present, and were used to keep African Americans out of the voting polls in the South. The sensationalization of the sinking of the Maine kicked off the Spanish American war, and was one of the first issues of ‘fake news’. This led the United States to start an imperialist movement. These are only a few examples of this craziness of the past. The past had its own set of issues that we can make comparisons to those we face today and learn from them.

**Abstract Code:** O49

**Presenter(s):**

Thomas Anderson

**Faculty Mentor(s):**

Susantha Herath

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** 5G Networks and Internet of Things Security

**Abstract:** I will be describing the effect of the new 5G network on the Internet of Things. The main focus will be security of smart home products. There will be a small amount of information given about industrial IoT as well.

**Abstract Code:** O50

**Presenter(s):**

Nicole Schrom, Stacy Nelson

**Faculty Mentor(s):**

Susantha Herath

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** IoT Forensics

**Abstract:** Throughout time technology has continuously evolved integrating commonly used items into an ever-growing network. The result of these connected devices is known as the Internet of Things (IoT). It encompasses items from smart light bulbs, to smart televisions, to Bluetooth enabled toothbrushes. IoT is a growing trend that is expected to connect over 31 billion devices worldwide by 2020. The creation of IoT devices has led to advancements in digital forensics, creating a new area of focus known as, IoT forensics. IoT forensics has opened the door to help close some of the hardest unsolved cases. Although this technology has helped in multiple investigations, it has created somewhat of a grey area. There has been numerous arguments and discussions over the legal procedures and protocols that should be used to obtain the data collected by these devices.

**Abstract Code:** O51

**Presenter(s):**

Joshua Wolbeck

**Faculty Mentor(s):**

Md. M Hossain

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Internet of Things: Microcontroller connectivity

**Abstract:** Internet of Things is becoming a major topic in our culture. My project is about the process and theory around connecting to the Internet through another device from a microcontroller. The idea of just connecting to the internet seems easy when smartphones and manufactured smart devices are already created and in our hands. Although, in the case of connecting a simple microcontroller to the internet it can be a more daunting task. I go over a couple different techniques for connecting simple microcontrollers like Microchip's PIC to the internet using devices such as Uart Serial-to-WiFi, WiFi SMD, or Ethernet controllers. This will also go coupled with a basic teaching of what the internet does and protocols behind the mentions communications.

**Abstract Code:** O52

**Presenter(s):**

Anastasia Cunningha

**Faculty Mentor(s):**

Md. M Hossain

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** How is Nuclear Magnetic Resonance Possible?An Explanation of the Physics Behind NMR Technology

**Abstract:** This project delves into the physics behind nuclear magnetic resonance technology, and directly relates it to the work being done for the Nuclear Magnetic Resonance Spectroscopy Senior Design project currently in progress within the Electrical and Computer Engineering Department. The physics behind the technology outline the design specifications of an electronic device which can be produced within the scope of the ECE curriculum. The project looks into the creation of a uniform magnetic field, an oscillating electromagnetic signal which meets necessary frequency, intensity, and duration requirements, and a system to measure outputs and derive meaning from them.

**Abstract Code:** O53

**Presenter(s):**

Jorda Stanek, Kaushalya Nissanka, Pecheng Chang

**Faculty Mentor(s):**

Eric Little

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Synthesis of Carbon Nanotube and Silicone Rubber Matrix

**Abstract:** This project was designed to execute techniques and knowledge acquired at St. Cloud State University to refine a technique to distribute carbon nanotubes (CNTs) in a silicone rubber matrix. While different formulations of CNT-embedded silicones have been explored in the literature (see Multi-Walled Carbon Nanotube/Silicone Rubber Nanocomposites by Katihabwa, et al., for example), current research has not provided a reliable means to distribute CNT into the silicone matrix. A review of the literature suggests that a homogeneous distribution of CNT in a silicone matrix can lead to exciting new products, such as photon absorbing solar panel paint, aerosolized piezoresistive sensors, and biocompatible medical sensors.



**Abstract Code:** O54

**Presenter(s):**

Austin Barsness

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Troubles 2.0? The Political Debate Surrounding Northern Ireland caused by the Brexit Vote

**Abstract:** I was planning on studying the political aspects of the debate over the border with Northern Ireland and the Republic of Ireland for my individual project. I was planning on looking up the historical context as to what the issues in the region were, mainly the Irish Independence from the United Kingdom and how Northern Ireland remained a part of the UK, the Troubles that lasted from the late 1960s to the mid-1990s, and the Good Friday Agreement that had ended The Troubles, and then use that to set up what the issue is regarding the border today, and what the potential impacts of the Brexit vote could be. I will ask several people in the UK questions regarding the potential options available and how/if the border's impact was considered when people were voting for or against Brexit. I will also look into the options that are available to solve the issue, whether it is a soft border between the two regions of Ireland with the hard border impacting only the Island of Great Britain, or a hard border between the two regions of Ireland, or a referendum to have Northern Ireland join the Republic of Ireland and leave the UK entirely.

**Abstract Code:** O55

**Presenter(s):**

Alexandra Hedquist

**Faculty Mentor(s):**

Mark Muniz

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** "Trace Element Analyses and Protein Analysis of Obsidian Artifacts Found at Site FN021 in Sherburne National Wildlife Refuge, Central Minnesota"

**Abstract:** This project discusses the methodology used, as well as the results of analyses that were completed on three obsidian flakes found at a Woodland period archaeological site located in central Minnesota. The site, named FN021 by the US Fish and Wildlife Service, was excavated during St. Cloud State University's 2018 summer field school. The presence of exotic raw materials, like obsidian, suggests the practice of long distance trade and the development of more complex social networks during the Woodland period of central Minnesota. The goal of this research was to determine the geologic provenance of two obsidian flakes, and to analyze the third for traces of blood and/or lipid residue. A trace element analysis, using non-destructive energy dispersive X-ray fluorescence (EDXRF), was completed on two flakes to ascertain their geologic origin. A second trace element analysis was then completed, on the same two flakes, using non-destructive scanning electron microscopy and energy dispersive spectroscopy (SEM-EDS) to generate baseline compositional data that was compared to the results of the EDXRF analysis. Finally, a protein analysis, using counter immunoelectrophoresis (CIEP), was completed on a third flake to determine the presence of blood and/or lipid residue.

**Abstract Code:** O56

**Presenter(s):**

Paul Voeltz, Thomas Anderson

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Digital Forensic Analysis of Criminal or Company Policy Case

**Abstract:** Tom Anderson and I will be presenting the results of our project in IA681- Digital Forensics. This presentation will begin with a brief overview of what digital forensics is and what tools we used during our project. The body of our presentation will go over the criminal or company policy case that we were assigned to analyze. Each group in our class must create a "digital crime" and leave a trail of evidence for another group to follow and document. These crimes can be simple breaches in company policy or as complicated as clues that lead to a murder or kidnapping. Our presentation will walk the audience through each step in our investigation. The presentation will conclude with our case findings report.

**Abstract Code:** O57

**Presenter(s):**

Grace Thompson, Chukwuemeka Monwuba

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Examination of Cyber Crime Creation and Investigation

**Abstract:** As a project for IA 681 we plan to team up with other groups of students in the class to create fake cyber crimes that other groups will attempt to solve. These fake crimes will include documents, files, and other data that hint towards illegal activities. Currently, the plan for the fake crime is to make it seem as though fictional people were engaged in the buying and selling of endangered and exotic animals and animal products. We will then take a crime another group has created and similarly try to solve it. We plan to do this through examining files and data on memory storage devices using digital forensics tools that will allow us to find files that may have been hidden/deleted. After having created fake crimes and attempting to solve others we will present our findings on steps someone might take to hide their involvement in a crime but also the steps investigators use to uncover hidden evidence.

**Abstract Code:** O58

**Presenter(s):**

Matthew Maciej, Nathan Skroch, Neil Feneis, Adam Kollman

**Faculty Mentor(s):**

Serdar Sezen

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Exploration of Vibrations with Interactive Testing Modules

**Abstract:** The mechanical engineering education experience often lacks fundamental, hands-on applications of the knowledge the students are expected to learn. This problem can lead to a disconnection in students between course material and its relevance to the real world. Because engineering is, at its core, the application of science to the real world, this can be a considerable issue. This project aims to remove that disconnection, and bridge the gap between the classroom and real life in one of the more abstract mechanical engineering concepts, vibrations. In tandem with the university's Labworks Flexure Table and accompanying VibrationVIEW software, multiple interactive vibration modules will be constructed to highlight vibration phenomena including resonance frequencies, vibration damping, and modal analysis. Variable masses within each module will enable students to interact with the material and see how changes in a vibratory system manifest themselves in reality. Each module will be fabricated from scratch following original designs created by the project members. The modules also follow strict engineering design principles such as fatigue life and failure criteria, ensuring the safety and continued use of the modules to supplement classroom learning for the foreseeable future. Additionally, laboratory exercise procedures will be written for student and instructor use to guarantee proper use of the vibration table, software, and modules. Overall, this project will utilize existing university technology and the ingenuity of the project members to enrich the education of future students by safely presenting tangible vibration experiences.

**Abstract Code:** O59

**Presenter(s):**

Jacob Dallman, Ethan Duscher, Nicholas Hofmann

**Faculty Mentor(s):**

Yongli Zhao

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Evaporation Project

**Abstract:** The Evaporation Project is in partnership with the L.S. Starrett Company, Tru-Stone Technologies Division. This project was selected for our team to determine the sources of water loss in the ALAR system and the concentration of chemicals in the air, where the ALAR system is a recycled water system used for 13 machines. This water comes in from the city, is softened, and then added into the dirty water tank which also includes water just used with the machining processes, where a level in this tank determines the need for more water in the system. The water is then filtered through the ALAR drum with diatomaceous earth caked on before being housed in a 10,000-gallon clean water tank. The water that is being used for the machines can be vaporized as processes occur, causing water particles to be dispersed into the air. When chemicals are added during the week the water will be at its highest concentration of these chemicals, and thus the machines that use the water can disperse their largest proportion of these chemicals into the air around the workers that are overseeing the processes on the machines. The main objective of this project is to determine where a loss of approximately 250 gallons of water a day is going in the ALAR system. The second objective is to determine the air quality surrounding the machines that are linked with the ALAR system by finding the concentration of the added chemicals in the air.

**Abstract Code:** O60

**Presenter(s):**

Connor Huberty

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Divided America: Looking back at Inequality in the U.S. During WWII

**Abstract:** While many people think the United States came together in unity to lead the allies in the second World War, there were many divisions among the American people. The purpose of this presentation is to shed light on the troubling divides between race and gender in America while the country was trying to defeat the Axis powers and promote equality. Accounts from soldiers and media members from the time will show that America specifically had a gender divide during the time period, and many people thought that women should take a secondary role in society. It was seen as their duty to tend to the house and raise their children while the men went out and worked. This idea was called into question by some people when many men went off to fight in the war, and women stepped into the workplace to cover for them in wartime production. At the same time, members of the media began to question if women should be allowed to keep those jobs permanently, or if they should hand them back over to the men they previously belonged to. This debate spurred one of the largest shifts in gender equality in America in its history.

**Abstract Code:** O61

**Presenter(s):**

Hunter Hillestad, Nathan Stanek

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The New South and Tran-Mississippi West

**Abstract:** After the Civil War slaves were set free and were able to go on and start their own life. The United States also started expanding West and this is an era known as The New South and the Trans-Mississippi West. Many people think that after the Civil War everything was good and that there was no discrimination and that everyone was treated equally. However that is not the fact, the fact is that there was still a lot of discrimination going on and people of color were still not accepted in society. As the United States started to expand west many people of color moved to western states to get away from the discrimination of the south but as they moved, discrimination followed them. After the Civil War African American citizen were granted rights such as voting. This did not suit well for many southern states and after just a few years of African Americans being able to vote the southern states took away African Americans rights to vote. African Americans weren't the only people of color that were discriminated against. Native Americans were also discriminated against, after the war Native American tribes were known as autonomous nations and many of them had treaties with the United States regarding many different things. Years went on and the United States started breaking treaties and pushing tribes off of their land and onto reservations set up by the government, as this happened the tribal status started to shrink. As a result of being forced onto reservations numerous Native American tribes decided to fight back against the settlers. One of the most famous battles between these groups was the Battle Of Little Big Horn, were the Sioux and Cheyenne defeated Custer and his army. The time period after the Civil War it wasn't peaceful at all but in fact was the same as before the Civil War besides for slavery. People of color were still discriminated against and treated like they were not even humans. It would take almost another hundred years before African Americans and even people of other color were fully accepted into society.



**Abstract Code:** O62

**Presenter(s):**

Renee Anick

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** A New Way to See The New Era

**Abstract:** The 1920's are usually portrayed as a time of prosperity and wealth for everyone in the United States, this is not always the case. When you look at textbooks, they show the positive sides of the 1920's, a booming economy, major developments of Mass media, successes for women, and many other positive aspects of life. This presentation will show many aspects to the 1920's that are not commonly seen. Some of these include: extensive oppression against women and people of color, positive and negative social movements, politics, and religious persecution. The research I have completed has shown that the 1920's did indeed Roar, but not for the reasons people assume. Primary sources I have found show that although the 1920's were a time of economic prosperity and gains for many people, the era is much more extensive than that. A family living in down town New York City did not experience this era the same way as a family living on a farm in Kansas. For many people this era was a great time, but some of the factors of this include location and socioeconomic status. Through this presentation I will show you a new way to look at the New Era, some of the negative sides of the 1920's, as well as the impact it took on the American people.

**Abstract Code:** O63

**Presenter(s):**

Ryan Allen

**Faculty Mentor(s):**

Robert Galle

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** A New Look at the Gilded Age

**Abstract:** There is this notion around the Gilded Age where the United States transformed from an agricultural to industrial society and that it was good for everyone. The businesses and technology expanded with our country and we progressed with no tension. My research proves this notion false. My project will show how much struggle the working people faced during this time. With the help from primary sources, firsthand accounts, and many other documents I intend to show that while people like Andrew Carnegie and John D. Rockefeller were making large sums of money it does not mean that everyone during that time period prospered the same way. There are many accounts of workers, immigrants, women, and children that prove that the working class was taken advantage of and were denied benefits that were seen as unnecessary and radical at the time. These benefits included what we take for granted for every day, such as 8 hour workdays, equal pay for both men and women, and the abolishment of child labor. I will also show just how brutal the struggle was for the workers that were trying to unionize by also incorporating events such as the Haymarket Riot and Homestead Strike that proved how much agency the workers had while being treated so terribly.

**Abstract Code:** O64

**Presenter(s):**

Richard Elchert, Connor Huberty

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Divided America: Looking Back at Inequality in the U.S. during WWII

**Abstract:** Many people believe that the United States was a unified nation as we entered the second World War because we began fighting for freedom and equality in Europe. What people don't know is that there were still many problems with equality back home as well. To start, as African American minorities began enlisting in the Armed Forces, it was strictly segregated in the army and navy while the marines wouldn't even take them. Black soldiers were typically assigned to noncombatant roles such as cooks and servants and forced to live in separate barracks and housing facilities that were covered with black walls. The American Red Cross even kept "black" and "white" blood plasma separated as if there was a difference. In addition, after the attacks on Pearl Harbor, the U.S. enforced laws and customs towards Japanese Americans that didn't allow them to vote, own land, or live in decent neighborhoods. The United States built concentration camps in the western states and forced Japanese "aliens" into these segregated areas, held in wire-enclosed compounds by armed guards. Although these concentration camps were not as severe as the Nazi death camps, they were still built on racism and fear and violated many civil rights and liberties that Americans believed they were fighting for. Many people don't realize that as the United States was fighting for freedom and equality in Europe, we were fighting the same battle back home for years before and after the second World War.

**Abstract Code:** O65

**Presenter(s):**

Jeremy Weiland

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Industrial Order Examined

**Abstract:** While many people consider the late 19th to early 20th century a time of great innovation and prosperity, it was also a time of significant struggle and conflict. The purpose of this presentation is to provide a greater understanding of the time period and provide a new perspective by utilizing a broad sample of primary sources from this era. The goal is to remove the rose-colored glasses and look behind the curtain to reveal what life was like during a time period that most think of as smooth sailing. My method of doing so will be by presenting the not so often talked about struggles that immigrants faced and opportunities they could not partake in because of financial situations. I will also show that although not in a major war, this was not a peaceful time. Labor disputes were in full force as unions tried to gain traction within what seemed like a rigged capitalist economy. I will show the incredible stress and frustrations faced by industrial workers as the industry began to boom, and I will touch on the ways many of these workers coped with the mental and physical stress of long days filled with manual labor cast under a shadow of uncertainty.

**Abstract Code:** O66

**Presenter(s):**

Sonya Smetana

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Between Wars: Important Events in America from 1877 to 1900

**Abstract:** There is a perception that the period in American history between the Civil War and World War I was uneventful. This perception is false. In the last two decades of the 19th century, the United States was stuck in a political stalemate. The Republican and Democrat parties clashed over policies and values. Many smaller parties, including the Populist Party, emerged, but could not attract the masses. It was a period of weak presidential power and public unrest. Presidents Rutherford B. Hayes, James Garfield, Chester A. Arthur, Grover Cleveland, and Benjamin Harrison held little power compared to congress, which dominated Washington D.C. Tension grew for Americans during the Depression of 1893, as working and middle classes struggled to make ends meet. Jim Crow Laws were enacted by state legislatures to further persecute African Americans. In response to Jim Crow Laws, Ida B. Wells and Booker T. Washington emerged as influential African American leaders. At the same time, the United States attempted to fulfill goals of expansion abroad. The American imperialist strategy was justified by democracy, free enterprise, and Protestant Christianity. Countless horrors were committed by Americans during the imperial period in the Philippines and Cuba. Between the Civil War and World War I, American history was far from uneventful. This project will show important events that took place in the last two decades of the 19th century.

**Abstract Code:** O67

**Presenter(s):**

Amanda Strom, Michael Knight

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Lesser Known Events of the Early 1900s.

**Abstract:** When people think about the early 20th century in the United States, they might only think about economic and political expansion or the events that lead up to World War I. While these are all things that were happening during the early 1900's, so were women suffrage and racial discrimination. Women and African Americans were only a couple of the groups who took over duties on the home front during the war, yet they both faced discrimination in more ways than one. Throughout the country women were fighting for equality and every day rights. At the forefront of that movement was Alice Paul, who fought in opposition to the war and the right for women to be able to vote. African Americans were expected to step up and fight for their country, yet they returned home to places where they were not welcomed or accepted, and were fighting for their lives once again. This presentation will show the happenings and significance of these lesser known stories and contributions on the American home front during the early 1900's.

**Abstract Code:** O68

**Presenter(s):**

Naomi Kuplic, Renee Anick

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Women of the 1920s: Hear them Roar.

**Abstract:** This era was a time when it was thought that everyone was experiencing wealth, a time of happiness and ease, but this was not always the case, especially for women. Prior to the role women took on in World War I, they still were restricted from participating in certain activities and thrown in jail for swearing and smoking. In the 1920's young women were seen as independent and more liberated with drinking in public and dressing as "flappers". Women were making strides during this time and had to fight for their new sense of independence. It is often portrayed that women were given the right to vote, rather than fighting and going through the many setbacks that it took to get there. Most textbooks do cover this topic but do not always go into detail about the struggles and hardships that the women overcame to get there. Students usually are taught that this was the time period that women earned the right to vote. This era tends to portray women in a happy and carefree way, rather than the hard workers that most women were. In this presentation I will examine the differences on how women were treated based on what they chose to do, their experiences, both the positive and negative aspects, and how they came to accomplish their goals. Along with the trials that women faced to gain a sense of equality and freedom.

**Abstract Code:** O69

**Presenter(s):**

Jenevieve Jaax

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Progressive Era? Schmogressive Era!

**Abstract:** When thinking of the period in the United State’s history from the late 1800s to the early 1900s, the narrative that comes to mind is one of progress for all, a country moving forward into the future, and a government that worked in the interest of its people. In fact, this “Progressive Era” in America included a variety of experiences that did not fit into this narrative. For example the increase of immigration caused the United States to become a “mixing pot” of cultures and traditions. While this is a positive, this new influx of immigrants caused tension and a heightened sense of nationalism and nativism. In addition to immigrants fighting to be seen as equals, Native Americans during this time were also fighting for rights such as citizenship and to be seen as equals in society and politics. Even those who we have learned to adore and see in a romanticized way were not as pure as they are made out to be. Theodore Roosevelt, one of the nations most recognizable presidents, is known for his days as a Rough Rider, his creation of national parks, and his use of Square Deals to help save the American economy. In reality, Roosevelt was flawed, and not every decision he made was perfect. Many argued that Roosevelt’s involvement and decision to occupy the Philippines was unjust and shows the imperialist side of this well known president. This presentation will show how the title “Progressive Era” was not accurate for all Americans.



**Abstract Code:** O70

**Presenter(s):**

Madelyn Kane, Austin Eastwood

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Great Depression and The New Deal

**Abstract:** The Great Depression is viewed as a time of indiscriminate and extreme suffering for American people from all walks of life. For my project I will discuss this period in American history while attempting to distinguish the unique ways that different demographics of people (based on things like sex, race, class, and geographic location) faced this time and were effected by it. I will also try to connect the effects that the great depression had on groups of people during its time to present circumstances of the same group. Though there is good reason for most to view the Great Depression and the time period surrounding it as a completely negative time in American history, I will make an effort to highlight some of the "wins" of the era. This will include individuals that prospered as a result of their time, as well as ways in which different groups advanced their agenda (both politically and socially) during the era. I will examine how the events during this time period effected different social and political movements and analyze the importance of these links. I believe focusing on the progress that took place during the time period surrounding the Great Depression and the New Deal will add a positive spin to the era that may be new to some.

**Abstract Code:** O71

**Presenter(s):**

Hailey Lachinsk

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** You Can't Handle the Truth: a Complicated History

**Abstract:** Urbanization and the rise of industry in the early United States saw city life that fostered a vibrant, diverse, efficient, opportunity filled, corrupt, crime-ridden, over-crowded, diseased, divided, and impoverished life. Yet despite these varying experiences, history is often taught as if all Americans shared a uniform perspective and a single experience. But this is no more accurate in the past than it is today. Using the era of urbanization and industry in the United States (the late 1800s into the early 1900s) I will effectively complicate the preconceived notions many have about simpler times, while simultaneously proving that no one knows exactly what happened in the past. With progress comes conflict as with learning comes discomfort and in order to analyze broad patterns of today and throughout U.S. (and world) history, we must understand that the “American experience” does not exist, nor does the truth.

**Abstract Code:** O72

**Presenter(s):**

Caleb Campbell

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** New perspectives on the Great Depression and New Deal

**Abstract:** Many people tend to think that "everyone" was affected by the Stock Market Crash, but in reality that is not the case. There were many people that were impacted by this tragic event, but it was not everyone, which is a general misconception of this era. Throughout my presentation, I will debunk this myth and give you guys information that shows that this is not necessarily true. I will use different items, such as primary sources, other sources, and textbook information to show that this was not the case, even though it is a common misconception that everyone was involved in this event. I hope to give you guys valuable information that may debunk this common myth for you guys as well.

**Abstract Code:** O73

**Presenter(s):**

Austin Eastwood, Madelyn Kane

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Great Depression and the New Deal

**Abstract:** The great depression and the following decade are generally portrayed as a time where the stock market failed and some people lost their jobs, followed by a huge turnaround and immediate reversal due to Franklin Delano Roosevelt and his New Deal policies. But this basic showing of the era almost always glosses over or completely ignores many of the personal experiences that people faced, especially people of color, and instead paints everything with the broad brush of the common white family experience, which was also extremely diverse. The Great Depression resulted in massive economic strife with consequences such as the obliteration of job security, a general threat to stable housing, and a major loss of life, but we also see families that made it by just fine, where it was but a mere hiccup in daily life. If we take off our blinders and see the era in its entirety, the picture becomes clearer and much more diverse. The hardships faced by people such as Cesar Chavez and his family who were forced to travel to find work, and consequently stuck to living in their car, contrast heavily with the over two-thousand world war one veterans that marched on Washington DC to pressure the government to compensate them as promised for their war efforts in the form of Bonus Checks. Even more unique are the stories of those who made riches during the great depression, such as William Benton, and benefited heavily because of it. The era of The Great Depression was an extremely diverse and complicated time, with many different puzzle pieces fitting in to the whole picture in different ways.

**Abstract Code:** O74

**Presenter(s):**

Brett Setnes, Mitchel Koebnick

**Faculty Mentor(s):**

Robert Galler

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Reconstructing What we Know About Reconstruction

**Abstract:** For this presentation, the focus will be on the broader aspect of the United States during Reconstruction. “Broader” as in the big picture, how Congress was very divided on how to solve the problem of integrating the South back into the Union, along with integrating the South with former slaves. How these former slaves were to be dealt with was one major issue, and the other was how to enforce the Reconstruction policies set in place. I will also be taking a closer look at the presidential administrations of Andrew Johnson and Ulysses S. Grant, as they have been both praised and criticized in their preservation of the Union in the wake of Abraham Lincoln’s assassination. As said before there has been both praise and criticism and neither side would be wrong, or completely right for that matter. The time of Reconstruction is seen as both a huge failure and a huge success, and both sides have strong evidence for both however that is not the overall narrative given to students within the United States. It is portrayed in textbooks that Reconstruction worked to its full potential, and that because the 13th Amendment was passed and the slaves were free the country was finally better, when in reality there were some good things that happened mixed with just as much bad. The goal of the presentation is to show that Reconstruction had just as much positive effects as negative and that both aspects need to be taught more often.

**Abstract Code:** O75

**Presenter(s):**

Madellen Schetnan

**Faculty Mentor(s):**

Monica Garcia-Perez

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Discrimination by Association in the Workplace

**Abstract:** This project will study a relevant component in the economy that affects the labor markets. The research would revise the traditional and most current literature discussing the issue and the empirical work and techniques evaluated in published work in the economic literature. This project will focus on discrimination in the workplace, specifically discrimination by association. Discrimination in the work place seems to be slowly fading away, which is great news. There are many laws in place that make this possible. Discrimination by association, however, is a bit tougher to catch onto than the other more "common" discriminatory characteristics that people often notice. Unlike age, gender, religion, etc., it is a little bit easier to cover up discrimination by association. A great example of this would be a manager not hiring a woman/man because they notice that they have an autistic child, and they then assume that they would more than likely miss days of work to take care of their child, so they choose not to hire said person. Discrimination by association is actually the most relevant form of discrimination in this day and age . The EEOC (Equal Employment Opportunity Commission) reported in 2017 that 48.8% of all complaints filed had to do with relation/association discrimination. This project looks to further research these statistics and to look more into why this is still such a prominent issue.

**Abstract Code:** O76

**Presenter(s):**

Diego Guerrero

**Faculty Mentor(s):**

Monica Garcia-Perez

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Labor supply of female immigrants in the U.S.

**Abstract:** This project will study the labor supply of female immigrants in the US. We will examine the trends of labor force participation and labor market of female immigrants. The research will revise the traditional and most current literature discussing the labor market of immigrants and its gender differences, and the empirical work and techniques evaluated in the economic literature.

**Abstract Code:** O77

**Presenter(s):**

Allison Bily

**Faculty Mentor(s):**

Monica Garcia-Perez

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Role of Financial Incentives in Workplace Wellness Programs

**Abstract:** This project will study a relevant component in the economy that affects the labor markets. The research would revise the traditional and most current literature discussing the issue and the empirical work and techniques and evaluated in published work in the economic literature.



**Abstract Code:** O78

**Presenter(s):**

Trevor Meed

**Faculty Mentor(s):**

Monica Garcia-Perez

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Unions, An Answer to the Federal Minimum Wage?

**Abstract:** This project will study a relevant information on Unions in the economy that affects the labor markets. The research would revise the traditional and most current literature discussing the issue and the empirical work and techniques evaluated in published work in the economic literature.

**Abstract Code:** O79

**Presenter(s):**

Jedd Helgestad

**Faculty Mentor(s):**

Monica Garcia-Perez

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Labor Market Mobility and Movement of Workers

**Abstract:** This project will study a relevant component in the economy that affects the labor markets. The research would revise the traditional and most current literature discussing the issue and the empirical work and techniques evaluated in published work in the economic literature

**Abstract Code:** O80

**Presenter(s):**

Marylin Rodriguez

**Faculty Mentor(s):**

Monica Garcia-Perez

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** How would removing the millions of illegal immigrants affect the labor market of the United States?

**Abstract:** This project will study a relevant component in the economy that affects the labor markets. The research would revise the traditional and most current literature discussing the issue and the empirical work and techniques evaluated in published work in the economic literature.

**Abstract Code:** O81

**Presenter(s):**

Emeka Ihekweazu, Akwarandu Onyekachi

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** One-Half Cent Crime

**Abstract:** Here we are going to give an extensive look on the oldest form of crime in the banking industry , which is the one -half cent crime .Banks commonly tracked money in accounts to the third decimal place or more. They used and still use the “rounding up” accounting method when paying interest. If the interest applied to an account resulted in a fraction of a cent, that fraction was used in the calculation for the next account until the total resulted in a whole cent. It was assumed that sooner or later every customer would benefit. Some computer programmers corrupted this method by opening an account for themselves and writing programs that diverted all the fractional monies into their accounts. In small banks, this practice amounted to only a few hundred dollars a month. In large banks with many branch offices, however, the amount reached hundreds of thousands of dollars.

**Abstract Code:** O82

**Presenter(s):**

Seshi Reddy Guda, Anoosha Kathi

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** A Family Killed by a Criminal

**Abstract:** A family of two children and a couple were known for their business of counterfeiting others for their identity card processing work by taking their original documents and preparing fake ones out of them. On a fine day, a well-built man visits them and asks them to create a concocted passport for his purpose to travel overseas. The man provides his details to the family and the family tells him to come after a week to collect his fake passport. The family, unaware of the fact that he is a criminal, creates his fake passport using his original identity and all the details provided to them by the man. The man comes back with an intention of murdering the family in order to clean his records and keep himself off the loop. The family gives him his fake passport and the criminal pays to the family in the form of cash and gives them poisoned sweets as a gesture of thanking the family for giving him his fake document(passport). The person in the family who collects the cash, dies over a span of two hours while counting the bundle directly in his hands to separate the note leaves using his saliva. Little did he know that each leaf surface was being poisoned by the criminal. The rest of the family members also die over a similar time span, upon the consumption of the sweets provided by the criminal. The criminal, does a simple gimmick to escape from the police and makes the overall scene look like an accident rather than a murder. Here, In this case there are two offensive scenarios. One being 'cyber crime' committed by the family and the other was 'murder' committed by the criminal.

**Abstract Code:** O83

**Presenter(s):**

Satiah Tugbe, Charles Owusu

**Faculty Mentor(s):**

Mark Schmidt

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Forensics Application in Curbing digital crimes

**Abstract:** Project will dive deep in the science of Computer Forensics and its application in investigating digital crimes in the work place.

**Abstract Code:** O84

**Presenter(s):**

Justin Hauswirth, Shawn Kamphuis, Joel Vincent

**Faculty Mentor(s):**

Serdar Sezen, John Sinko

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Vacuum Chamber Lens Positioning System

**Abstract:** The purpose of this project was to design a high vacuum positioning system to assist laser propulsion research, allowing research to be done faster and with greater accuracy. For this research, a vacuum chamber is fitted with lenses and an aluminum plate target for the laser. For experimentation, these lenses need to be adjusted often. Without a positioning device with controls outside of the chamber, the vacuum pressure must be released each time adjustments must be made. Reaching high vacuum pressure takes up to twenty four hours so needing to adjust sets back data collection substantially. The main goal of this project was to design and install a system that can adjust focusing lenses remotely without needing to release vacuum pressure, and install an in-line camera to aid in focusing and documentation. The system utilizes a single motor input to drive two carts holding lenses. Each cart has a solenoid clutching mechanism to transfer motion from the rotary input to the linear movement of each cart individually. The position of the carts are determined using a visual positioning system and limit switches on either end of the carts'. The user can define the position of each cart and the program will run to position each lens. Completion of this makes research more efficient, greatly reducing the number of times the chamber must be pressurized.

**Abstract Code:** O85

**Presenter(s):**

Smitha Ravikumar, Fnu Pushpavati, Babafemi Babajide, Aakansha Joshi

**Faculty Mentor(s):**

Hiral Shah

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Value Stream Map for the Transactional Process in a Medical Device Manufacturing Company

**Abstract:** Starting from work order generation till shipping, the current process used at the medical device company was not optimized to handle lean problems, had large processing time gaps and knowledge gaps across the team. The objective of the project was to develop a new value stream map for the transactional processes in the assembly area of a medical device manufacturing company. The transactional process involved work order creation, traveler generation, transactional work (updating inventory), label printing, kitting, component issuing, sales order generation, rework and finally preparing documents for shipping. All the processes were performed sequentially and had its own process time. Time studies were conducted and data obtained was analyzed to create a new Value Stream Map in order to address the problems and improve the current process. Detailed results from the study will be discussed in the presentation.



**Abstract Code:** O86

**Presenter(s):**

Emily Jaeger

**Faculty Mentor(s):**

Lucas Volini

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** AAMFT 2019 National Conference Presentation

**Abstract:** The Genogram-Gestalt: An Assessment for Unfinished Business was chosen to present at the annual national American Association of Marriage and Family Therapy conference and will be hosted in Austin, Texas. The genogram-gestalt is a method of assessment and intervention, utilized in the marriage and family therapy field that recreates the client's emotional system. As the therapy client recreates their genogram while acknowledging unfinished business with various family members, a gestalt emerges that recreates the relational dynamics and encourages cathartic, emotional expression. It is through the ability to actualize unfinished business throughout the client's family's emotional system that they will be able to use that information to decide how to move through the emotional fusion that exists in their family system. The presenters will provide an overview of the theoretical background informing the creation of this intervention. This is an original intervention created by the presenters and will be utilized by professionals in the marriage and family therapy field. The presentation will also include a description of how the intervention is applied in a therapeutic context. Case study results and implications for the marriage and family therapy field will be discussed regarding the effectiveness of the genogram-gestalt assessment and intervention tool.

**Abstract Code:** O87

**Presenter(s):**

Brad Walters

**Faculty Mentor(s):**

Shiju Zhang

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** National Health and Nutrition Examination Survey

**Abstract:** This project is designed to provide understanding of lab results and diagnosis of a condition. Specifically, we will be analyzing the link between lab tests and the condition of diabetes. Secondary outcomes are to be determined. The use of JMP software will be implemented. The processes of data preparation, model building (linear regression and logistic regression), and model selection will be documented. The dataset that I will be working with is called the National Health and Nutrition Examination Survey. This dataset contains the results of a physical examination, lab results of specimen collected, and a socioeconomic survey. The hypothesis that I will be testing is that the A1C lab result is not an indicator of the condition diabetes. In order to answer this question I will start by exploring the data. This will reveal information about the typical range of A1C lab results and assist in the data preparation stage. During data preparation I will join the lab results data with the condition diagnosis data. Then I will fit a linear model and a logistic regression model. Once the two models are fitted I will determine the final model.

**Abstract Code:** P1

**Presenter(s):**

Meg Zielinski

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** The Genocide of Homelessness

**Abstract:** Walking through a subway tunnel, it seems as if homeless people are a natural part of the urban scene. They are easy to identify, clad in rags and representing various stages of unkempt hygiene. Slumped in corners lined with cardboard, they seem to go unnoticed by the busy commuters that pass them in waves. In actuality they are very much seen, more accurately an undesired nuisance. We have been trained as a society to look down upon and look away from homeless people. We are conditioned to ignore their existence, to write them off as nothing more than odorous decals to our daily commute. But why have we been taught to dehumanize these people? Homelessness is a topic that has fascinated me for many years. The stigma that has built around the homeless community is one that has grown to be extremely negative and disapproving, denying the humanity of people we are all too aware could be any of us. These people effectively become nameless and connectionless, seeping into the subway tile more and more every day. In conditions like these, it leads one to wonder if this portion of the population is unjustly treated. In my research, I will delve into the similarities between the stages of homelessness and those of genocide, looking for the connection between the two in relation to the ethnicities most at risk for homelessness. I will evaluate the defined and the unwritten rules to genocide and compare them to the processes that those in extreme poverty go through, specifically looking at general society and the government.

**Abstract Code:** P2

**Presenter(s):**

Rachel Taszarek

**Faculty Mentor(s):**

Cindy Gruwell

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Food Insecurity within the United States: How is it influencing Childhood Development?

**Abstract:** With the United States' ability to support over 300 million citizens, we still face the simplest need of all of humanity food. Food insecurity is the inability for people to provide themselves and their families with a nutritionally adequate diet at all times. They may run out of money for food toward the end of every month, or they may not be able to afford nutritious foods such as fresh fruits and vegetables(Sreenivasan,2009). Coined in the 1970s, this growing sociological problem has affected over 40 million American since 2017. While hunger refers to a physical and personal sensation, food insecurity is caused by a lack of finance or abundance of resources for a whole household. There isn't a single cause of food insecure families. Many of these families experience this due to the overlapping of low-income, affordable housing, social isolation, and medical costs. It strikes at the smaller but significant demographic for future generations children. Over 12 million children experience food insecurity, and their mental, social, and physical development are altered because of the lack of nutrition vital in the first few years. Children may experience an increase in hospitalization, obesity, iron deficient, and depression, all due to Food Insecurity It has become a growing matter in our future generations.

**Abstract Code:** P3

**Presenter(s):**

Madeleine LaFond, Amira Zaher

**Faculty Mentor(s):**

Marina Cetkovic-Cvrlje

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** The Effect of Sodium Bicarbonate Treatment on the Inflammatory Process in Type 1 Diabetic Mice

**Abstract:** Around 1.25 million Americans live with Type 1 Diabetes (T1D), an autoimmune disease that develops when insulin-producing  $\beta$ -cells in the pancreas are destroyed by an inflammatory process led by T cells. The absence of insulin induces hyperglycemia (high blood glucose levels) accompanied by numerous complications such as retinopathy, kidney and heart disease, nerve damage, and slow wound healing. There are several types of T cells; some directly kill  $\beta$ -cells, such as T-cytotoxic (Tc), or indirectly, such as T-helper (Th), while others, like regulatory T cells (Treg) actually protect them. A recent study showed that sodium bicarbonate ( $\text{NaHCO}_3$ ) induces anti-inflammatory pathway in the spleen by affecting a particular type of immune cells, macrophages. Therefore, it is hypothesized that  $\text{NaHCO}_3$  treatment will affect other inflammatory cells, such as Tc and Th populations. In order to test this hypothesis, T1D was induced in two groups of 7-week-old male C57BL/6 mice using streptozotocin (STZ) injections. Control group drank normal water whereas treatment group drank 200 mM  $\text{NaHCO}_3$ -enriched water. On day 30 of the experiment, mice were euthanized, and their spleens obtained for analysis of cell counts, viability, T cell proliferation, and differentiation/quantification of T cell subsets by flow cytometry. Whereas there were no significant differences in splenic lymphocyte counts and viability between control and treatment mice, a trend of decreasing Th and Tc populations was observed in  $\text{NaHCO}_3$ -treated mice. These preliminary results suggest that  $\text{NaHCO}_3$  might exhibit anti-inflammatory properties in its action on T cells, while not inducing toxic effects on treated mice.

**Abstract Code:** P4

**Presenter(s):**

Bernard Aucamp

**Faculty Mentor(s):**

Ryan Fink

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Enterobacteriaceae: Desiccation Survival and Thermal Tolerance of Closely Related Genera

**Abstract:** *Salmonella enterica* becomes tolerant to thermal treatments after extended exposure to low water activity. This adaptation raises significant public health concerns as *S. enterica* is able to survive common thermal food processing. Little is known about other Enterobacteriaceae genera's ability to acquire thermal tolerance after desiccation. *S. Typhimurium* exposed to dry conditions differentially expresses 719 genes. Among them, two virulence genes (*sopD* and *sseD*) were identified to be critical to *S. Typhimurium*'s ability to survive desiccation. From those genes, *sopD* is conserved at the genus level whereas *sseD* is specific to the species *S. enterica*. *Escherichia coli*, a closely related genus within the Enterobacteriaceae family, does not acquire thermotolerance post desiccation. The main objective of this study is to evaluate the survival of *Salmonella* and closely related genera when they are exposed to high temperatures after enduring dry conditions. This evaluation will provide a concrete scientific basis to advise food safety organizations and thus safeguard public health. Samples were exposed to a dry conditions ( $a_w = 0.11$ ) and heated at 85, 90, and 95C. D-values and growth curves were used to quantify the extent to which samples can endure dry conditions and tolerate heat. *S. enterica* showed the highest resistance to thermal treatment once equilibrated to  $a_w = 0.11$ , with *E. coli* and *S. bongori* not showing any resistance. A significant resistance to thermal treatment was observed when *C. freundii* was equilibrated to  $a_w = 0.11$ . *S. enterica* and *C. freundii* were found to be significantly better equipped in their ability to recover after thermal treatment and equilibration to dry conditions. The presence of SPI-1 and *sopD* in *S. enterica* is crucial to the acquisition of thermal tolerance within the genus *Salmonella*. This is identified through *S. bongori*'s inability to acquire thermal tolerance. Finally, the acquisition of thermal tolerance is a polyphyletic trait within the Enterobacteriaceae family prompting further investigation into *C. freundii* and its ability to acquire thermal tolerance.

**Abstract Code:** P5

**Presenter(s):**

David Reimer

**Faculty Mentor(s):**

Ryan Fink

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Transcriptional Response of Campylobacter Jejuni Within the Spinach Rhizoplane

**Abstract:** Campylobacter jejuni has been well studied and documented in its relation to poultry in nearly every aspect of growth to virulence to environmental susceptibility. More recently, within the past decade or so, C. jejuni along with some other Campylobacter species have been investigated as to their ability to form biofilms along various surfaces in aquatic environments. As in poultry studies, its virulence, growth, and susceptibility have also been documented as well as genetic factors inducing various protein production in response to such conditions. However, the incidence and viability of C. jejuni within vegetables is poorly understood. Due to most vegetables eaten in raw form, any infection stemming from such consumption is considered to be a result of cross contamination. Incidentally, reports have surfaced whereas clinical cases have been observed and reported with the claim of no possibility of cross contamination with meat. Increasing numbers of these reports prompted a limited number of studies that found C. jejuni in the soil of crops, mainly due to infected fertilization, as well as the surfaces of improperly washed vegetables not associated with cross contamination. The end results of these few studies have left open the possibility of vegetables that enter our markets with C. jejuni is due to either cross contamination with infected meats, contaminated soil adhering to the vegetables, or even inoculation into the vegetables via root systems. The later possibility has yet to be investigated in any significant manner. This study will help to bridge the gap of the possibility of vegetable crop internalization due to soil contamination of C. jejuni, demonstrating this as a potential source of food-borne illnesses.

**Abstract Code:** P6

**Presenter(s):**

Andrii Vatulin

**Faculty Mentor(s):**

Ryan Fink

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Characterization of a Biome Composition of Anaerobic Digesters of Different Type and Infeed.

**Abstract:** Anaerobic Digestion (AD) is a way of decomposition of organic matter in the absence of oxygen. This method is widely used due to its multiple advantages in comparison with a traditional waste management. The advantages of this waste utilization method include possible energy recovery in a form of a biogas, low energy requirements, reduction of greenhouse gases (particularly CO<sub>2</sub>) released into the atmosphere, and production of valuable biofertilizers. Unfortunately, because of the lack of information about composition and establishment of microbial community inside anaerobic digesters, systems of this type often suffer from a fatal collapse due to sudden changes of outside factors or the lack of tolerance of the biome towards certain chemical characteristics of the infeed. To better understand AD from the microbial stand point it is necessary to determine the core microbial composition of the system and describe pathways of the development and the tolerance of this microbial community in respect to changing outside factors (changing chemical composition of the infeed, changing physical characteristics of the infeed, etc.). As for the main research question of this project it is a description of a core microbial composition of an anaerobic digester running on food waste and/or fecal matter and creating a synthetic microbial community to challenge it with changing outside factors to determine the limits of its tolerance. In fact, samples of several anaerobic digesters of different design types will be compared to determine the core organisms responsible for the process of AD. At the second stage of the project a synthetic microbial composition will be developed based on the findings from stage one of the project. This stage will set up a scene for the next research initiative where the synthetic microbial biome will be challenged in a benchtop anaerobic digester by manipulating temperature, chemical, and particle size of the infeed.



**Abstract Code:** P7

**Presenter(s):**

Zachary May

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Evolution of Body Shape in the Deep-Sea Hatchetfishes (Sternoptychidae)

**Abstract:** Stomiiformes (dragonfishes and their allies) are a species-rich order of fishes (~440 species) that are primarily found throughout the meso-bathypelagic zone of the world's oceans. The bodies of Stomiiformes are covered in an array of bioluminescent photophores that produce light in their near-dark to dark environment. In contrast to the more elongated body plan of most stomiiform fishes, the family Sternoptychidae (hatchetfishes, ~78 species) has evolved a hatchet-like body shape. Few studies have investigated the evolution of body shape among stomiiform fishes, a lineage that has evolved exclusively in a pelagic deep-sea environment. In this study we use landmark-based geometric morphometrics to examine the differences in body morphology across the family Sternoptychidae. We also explore the evolution of body shape among hatchetfishes in the context of their evolutionary relationships inferred from a synthesis of genome-scale sequencing with ultraconserved elements and protein-coding gene fragments.

**Abstract Code:** P8

**Presenter(s):**

Jenna Nelson, Jace Engelmann, Logan Olson

**Faculty Mentor(s):**

Marina Cetkovic-Cvrlje

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** The Effects of Sodium Bicarbonate on Type I Diabetes in Mice

**Abstract:** Type 1 diabetes (T1D) is an autoimmune disease where inflammatory T cells attack insulin-producing beta cells in the pancreas, leading to increased blood glucose levels. The only current treatment, insulin injections, are expensive, leaving a great need for alternative methods of treating T1D. In a recent study, sodium bicarbonate (NaHCO<sub>3</sub>) was shown to have anti-inflammatory properties, raising questions about its potential for treating autoimmune diseases. Thus, the effects of NaHCO<sub>3</sub> should be evaluated in an experimental mouse model of T1D. It was hypothesized that NaHCO<sub>3</sub> treatment would decrease the incidence and severity of streptozotocin (STZ)-induced T1D in C57BL/6J male mice. To test this hypothesis, mice were placed into control and treatment groups. The treatment group received NaHCO<sub>3</sub> via their drinking water at a dosage of 200mM at six weeks of age, while the control group drank regular water. Mice were treated by STZ at seven weeks of age to induce experimental T1D. Glucose and body weight measurements were taken biweekly until mice were sacrificed at 12 weeks of age. Mice were considered diabetic after two consecutive glucose readings >250mg/dl. Analysis of the glucose data showed significantly decreased glucose levels and delayed diabetes development in treated mice compared to the controls. These preliminary results support the initial hypothesis, suggesting beneficial effects of sodium bicarbonate in prevention of mouse T1D, and highlighting the need for further study of its effects on autoimmune diseases.

**Abstract Code:** P9

**Presenter(s):**

Clara Welhouse

**Faculty Mentor(s):**

Cindy Gruwell, Mark Petzold

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** The Effects of the Increasing Immunization Schedule on Children in the United States and Its Influence on the Anti-Vaccination Movement

**Abstract:** In recent decades, the immunization schedule required for children in the United States has increased significantly because new vaccinations are being formulated. In this research paper I will investigate and explore the possible effects of this increase. My analysis will also focus on the emerging trends of blame that fall to the vaccinations administered to children; these criticisms lead to patterns of noncompliance to mandated immunization schedules. Medicine is constantly changing, this holds true for vaccinations. Currently, the Centers for Disease Control and Prevention recommends the administration of more than ten immunizations, some of multiple doses, for infants from birth to fifteen months of age. This is a significant increase since when the first mandated vaccines were administered. The effects of this increase are ambiguous and the vagueness has led to boycotts of vaccinations and suspicions of extreme side effects. For example, the MMR vaccine is being blamed for autism diagnoses across the country. The amount of modified strains of disease-causing pathogens being injected into infants and children is growing and it seems unknown if substantial research has been done to determine if this amount is safe and whether or not the human body can handle it. This paper serves to examine the power of the human body in terms of the capabilities and capacity of the immune system in fighting pathogens and the memory B cells by observing the side effects after vaccination and whether or not they can be attributed to the immunization schedule. This research project challenges the accusations against the MMR vaccine and others to be causing diseases and disorders like Autism Spectrum Disorder, but also considers the potential adversity caused by such a fast-growing immunization schedule, and accepts the reality that the human body has limitations which may be tested with the current vaccination requirements.

**Abstract Code:** P10

**Presenter(s):**

Lucy Rai Thulung

**Faculty Mentor(s):**

Satomi Kohno

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Endocrine Disrupting Chemicals in Storm-Water and Their Effects on Estrogen Receptor of the Northern Leopard Frog

**Abstract:** Skeletal abnormalities and malformations in northern leopard frogs have been reported in the urban areas of the northern U.S., which have concerned environmentalists about the endocrine-active contaminants level in water resources. Endocrine Disrupting Chemicals (EDCs) are chemicals that obstruct the endocrine system, which is responsible for the regulation of hormones. One of the ways EDCs contaminate lakes and ponds is by storm-water. For example: Phosphorous contaminants from the fertilizers get washed by the storm-water into the ponds and lakes. Although storm-water treatment ponds have been designed to check the level of EDCs, EDCs are not eliminated completely. Also, the treatment plants have provided some aquatic species a wetland habitat contaminated with EDCs, hence frogs with malformations, for instance, multiple number of limbs, have been observed. To determine the presence of estrogenic EDCs in the storm water treatment ponds, a reporter gene assay with the nuclear estrogen receptor will be utilized. Nuclear estrogen receptors are ligand-dependending transcription factors and regulate transcriptions by estrogens. Estrogens are the hormones responsible for regulation of female reproductive system and secondary sex characteristics. Estrogen hormone receptors of the northern leopard frog will be cloned and analyzed. If EDCs are present in the storm-water, the chemicals will bind to the ligand binding domain of the estrogen receptor. This in turn will bind with the hormone response element, a short DNA sequence which binds to the estrogen receptor complex and regulates the transcription of luciferase cDNA. The amount of transcribed luciferase is responsible for the luminescence signal density with depending on the receptor activation. EDCs are not only harmful to aquatic animals, but also to other animals. For instance: EDCs have also been found to be one of the factors responsible for breast cancer. Therefore, regulation of EDCs in the environment is crucial.

**Abstract Code:** P11

**Presenter(s):**

Katelyn Watkin

**Faculty Mentor(s):**

Kannan Sivaprakasam

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Analysis of Hydrogel Composite Properties for Thermal and Magnetic Application Capabilities

**Abstract:** The goal of this research is to synthesize and characterize hydrogel composites made with nanoparticles of graphene and magnetite. Specifically, to determine variation of magnetic and thermal properties of hydrogel-graphene/magnetite composites. The hydrogel polymers will be made from acrylamide. The ultimate goal is to synthesize a superior material for the use in electronic devices. The superior hydrogel would have the capacity to remove more heat from the electronic components, thereby reducing the degradation due to heat.

**Abstract Code:** P12

**Presenter(s):**

Joshua Moser

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Anatomy and Physiology of Combat Sports in the Human Body

**Abstract:** During the course of my project I am going to go in depth of how the human body is effected in the area of combat sports. Some of the things I will talk about are the various types of injuries and how they occur within the different systems of the body. Other topics covered will be weight cutting issues, stress on the body, different mechanisms of injury, abuse of hormones and steroids, and a few others. My goal is to gain an in depth knowledge of something I care about while also trying to my major which is nursing. I'm hoping that both of these combined will give me better tools academically for my future.

**Abstract Code:** P13

**Presenter(s):**

Fatuma Odowa, Abshiro Mayow, Ahmed Warsame

**Faculty Mentor(s):**

Oladele Gazal

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Effects of cardioactive drugs and aqueous extract of *Garcinia kola* on Heart rate in Water Flea (*Daphnia magna*)

**Abstract:** Herbal medicine is an important component of healthcare delivery approaches in many parts of the world. Very often, individuals that utilize herbal medicine simultaneously consume Western medicine. Currently the effect of the interaction between the active ingredients in both herbal extracts and western medicine is unknown. In the present study, we determined the effect of pre-exposure of a model organism, *Daphnia magna*, to the aqueous extract of *Garcinia kola* to the responsiveness of the heart rate to traditional drugs or chemicals that have chronotropic effects. *Daphnia magna* was first exposed to graded doses of epinephrine (0.001M, 0.01M, or 0.1M) or propranolol (0.001M, 0.01M, or 0.1M) or verapamil (10<sup>-7</sup> M, 10<sup>-6</sup> M, 10<sup>-5</sup> M, or 10<sup>-4</sup> M). Thereafter, *Daphnia magna* was exposed to various doses (31 to 500 µg/ml) of the aqueous extract of GK. In the final experiment, we determined the effect of pre-exposure of *Daphnia* to 125 µg/ml of CK for 3 minutes to the responsiveness of the heart to established chronotropic doses of epinephrine (0.001M), propranolol (0.001M), and verapamil (10<sup>-6</sup> M). Heart rates were determined in all experimental situations. Application of epinephrine significantly (P<.001) increased HR but the effect was not dose-dependent. Application of propranolol, verapamil, and GK extract dose-dependently decreased (P<0.001) *Daphnia* HR. Pre-exposure of *Daphnia* to 125 µg/ml of aqueous extract of GK significantly heightened the negative chronotropic effects of propranolol and verapamil but significantly (P<0.001) inhibited the positive chronotropic effect of epinephrine. These results indicate that GK aqueous extract has a negative chronotropic effect. Further, GK consumption may interfere with sympathoadrenal regulation of cardiac function in normotensive individuals. The marked negative chronotropic effects of co-administration of GK extract and either verapamil or propranolol suggest careful consideration of prescription of these drugs in patients with traditional consumption of GK.

**Abstract Code:** P14

**Presenter(s):**

Charles Christen

**Faculty Mentor(s):**

Heiko Schoenfuss

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** When Feminizing Male Fathead Minnows, It's All in The Mix

**Abstract:** Pollution within the aquatic environment is of growing concern and raises the question of biological consequences to aquatic life? Estrogenics are one type of pollutant in the aquatic environment that have the potential to impact aquatic life such as fish. Estrogenics create the same responses that the natural hormone estrogen triggers, like the production of vitellogenin. Vitellogenin is an egg-yolk precursor protein which is produced in female fathead minnows while reproductively active. Male fathead minnows contain the gene for vitellogenin, but it remains inactive unless triggered by estrogenic compounds in the environment. Using Enzyme-linked immunosorbent assays (ELISA) vitellogenin concentrations can be measured from blood plasma. Exposure to estrogenic compounds from the environment may feminize male fathead minnows, which results in decreases of fertility, sperm quality, and overall reproductive success. Vitellogenin in male fish serves as a biomarker for possible declining reproductive health due to estrogenic exposure. We exposed fathead minnows for three generations to chemical mixtures representing urban or agricultural pollutants found in watersheds around the Great Lakes. Nitrate exposure was used as a secondary stressor as it is commonly found in aquatic environments. Following the continuous exposure ELISAs were conducted using plasma from the adult fathead minnows of the first generation to assess potential feminization of male fathead minnows. Nitrate is speculated to trigger the mechanism responsible for feminization in male fathead minnows. However, the results show that in the first generation of males, there was no response related to nitrate or agricultural mixture exposures. In contrast, the urban mixture of chemicals produced feminization in first generation males. The results of this study provide a better understanding of how pollution in the aquatic environment is having a detrimental effect on fathead minnows and potentially other aquatic species.



**Abstract Code:** P15

**Presenter(s):**

Steven Johnson

**Faculty Mentor(s):**

Satomi Kohno

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Luciferase Lights The Way Toward Best Water Treatment Practices for Removing Endocrine Disruptors Using The Painted Turtle Estrogen Receptors

**Abstract:** Many aquatic animal species are drawn to the habitat created by the stormwater treatment ponds which were originally designed to remove phosphorus contaminants. Biologically active contaminants in stormwater runoff constitute a threat to wetlands and their aquatic wildlife including the painted turtle. Urban contaminants include pharmaceutical and personal care products, while agricultural areas have fertilizers and pesticides as primary contaminants. Some of these contaminants can disrupt the endocrine system which causes problems with the sex determination, reproduction, and behavior of aquatic species. Various stormwater treatments need to be evaluated for their efficiency of removing endocrine active contaminants. Since the painted turtle's temperature-dependent sex determination can be overridden by estrogenic agents, it is particularly at risk in urban wetlands. Therefore, it is essential to assess the estrogenic activity of the stormwater via the estrogen receptor in the painted turtle. To evaluate the estrogenicity of contaminants, the luciferase reporter gene assay with the estrogen receptor *In vitro* will be utilized. However, the assay system of the estrogen receptor in the painted turtle has not been established, although its sequence information is available in the database. Painted turtle estrogen receptors will be isolated and cloned into an expression vector. Cultured cells will be transfected with cloned receptors and the luciferase reporter, before being exposed to the stormwater collected from different types of stormwater treatment ponds. Hypothesis: there will be significant differences in estrogenicity via painted turtle estrogen receptors among the stormwater treatment methods. Results will provide evidence to evaluate the effectiveness of various water treatments which will identify the best water treatment practices as well as a better understanding of estrogen and its receptors evolution. Understanding endocrine function and sex determination in animals will lead to a better understanding of how to preserve the health of animal populations.

**Abstract Code:** P16

**Presenter(s):**

Sheldon Miks, James Gerads

**Faculty Mentor(s):**

Heiko Schoenfuss

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Effects of Urban Storm-water Runoff on Fathead Minnows: Mitigating Potential of Best Management Practices

**Abstract:** Urban storm-water runoff is often contaminated by a complex mixture of chemicals of emerging concern. These chemicals have not previously been detected or are now being detected at unexpected levels and may pose a threat to humans, animals, and environments. Urban areas are often defined by an abundance of impermeable surfaces, such as concrete, that act as a highway during precipitation events to move chemicals into storm sewers and drain to aquatic ecosystems. Prior studies have found traditional stormwater settling ponds to be ineffective in removing chemicals of emerging concern. This study investigates the effects that exposure to urban stormwater runoff may have on fathead minnows and the mitigating potential of iron-enhanced sand filtration as best management practices. Although iron-enhanced sand filtration is designed to remove excess dissolved phosphorous from stormwater, these filters also may mitigate chemicals of emerging concern as a result of physico-chemical and biological processes within the filter. We assessed biological effects of stormwater exposure across multiple life stages of the fathead minnow and measured growth, survival, hatch success, predator avoidance performance, and foraging efficacy. Here we show foraging efficiency and survival of larval fish are not altered by iron-enhanced sand filtration of stormwater when compared to standard stormwater ponds. The effects of stormwater exposure on fathead minnows is not substantial and mitigation ability of standard treatment is equal to iron-enhanced sand filtration.

**Abstract Code:** P17

**Presenter(s):**

Michael Shiferaw

**Faculty Mentor(s):**

Brian Olson

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Investigation of the Role of Smurf1 in PGC-1 $\alpha$  Regulation and Parkinson's Disease

**Abstract:** Parkinson's disease (PD) is a neurodegenerative disorder caused by the impairment and/or death of the dopaminergic neurons in the area of the brain that controls movement called substantia nigra. An estimated 60,000 people are diagnosed with Parkinson's every year in the United States and 10 million people worldwide who are already diagnosed with it. Symptoms of PD include rigidity and tremor, and impaired balance. The quality of life for most of the affected individuals is very poor. Low levels of the protein PGC-1 $\alpha$  have been linked to this disease, but efforts to find a chemical that causes higher production of PGC-1 $\alpha$ . It is important to know if we can reduce the degradation of PGC-1 $\alpha$  without affecting the rate at which it is being produced, thereby increasing PGC-1 $\alpha$  levels. Initial studies have shown that the protein SMURF1 may be a ubiquitin ligase which targets PGC-1 $\alpha$  for degradation, and it is likely an oncogene. This is believed to be the case because an increase in SMURF1 levels in cells causes a decrease in the levels of PGC-1 $\alpha$  within these same cells. However, it is possible that this effect is due to an increase in SMURF1 levels causing a change in the physiology of cells or some other nonspecific effect. Therefore, the next step in this study will be to determine whether or not PGC-1 $\alpha$  and SMURF1 bind directly to each other through co-immunoprecipitation experiments.

**Abstract Code:** P18

**Presenter(s):**

Paige Lay, Shelby Van Dreel, Scarlett Cheong

**Faculty Mentor(s):**

Heiko Schoenfuss

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Effects of Contaminants of Emerging Concern on Fertility and Fecundity of the Fathead Minnow

**Abstract:** Pollutants are very prevalent in the world around us, but their long-term impact has yet to be quantified. Contaminants of emerging concern (CEC) are introduced to aquatic environments by wastewater effluent and runoff from agricultural and urban lands. Fertility and fecundity, while very similar, can have vastly different effects on reproduction of fathead minnows (*Pimephales promelas*), when their processes are altered by aquatic pollutants. Vitellogenin (VTG) is an egg-yolk precursor protein typically expressed in reproductively active female fathead minnows. Estrogenic compounds introduced to the environment have been found to feminize male fathead minnows by turning on the VTG gene, which is normally inactive. Feminization of male FHM can cause decreased fertility leading to an overall decrease in reproductive success. This project examined changes in fertility and fecundity following long-term exposure of male and female fathead minnows to environmentally relevant concentrations of CEC mixtures. These mixtures represented urban and agricultural pollutants found in the Great Lakes watershed with nitrate used as a secondary stressor due to it also being commonly found in this aquatic environment. Fathead minnows were exposed over three generations with fertility and fecundity data being collected for the first and second generations. It was found in the first generation that high nitrate concentrations stimulated egg production while simultaneously countering the negative effects of the other compound mixtures. The results of this study help to provide a better understanding of how these chemical mixtures are impacting reproduction in the aquatic environment.

**Abstract Code:** P19

**Presenter(s):**

Alec Hafferman, Yasmeena Thabet, Ngefor Asangwe, Oyinlola Adeyemi

**Faculty Mentor(s):**

Heiko Schoenfuss

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Effect of Urban and Agricultural Pollutants on the Behavior of Fathead Minnows (*Pimephales promelas*) in the Great Lakes

**Abstract:** The North American Great Lakes are affected by pollutants from industry, manufacturing, and agriculture. These pollutants are of increasing concern due to their unknown biological consequences. Endocrine disrupting chemicals (EDCs), are chemical pollutants known to negatively interfere with the endocrine system, as well as causing abnormalities in the reproductive, nervous, and immune systems in aquatic species. EDCs combined with other toxic pollutants such as dichlorodiphenyltrichloroethane (DDT) and bisphenol A (BpA) are known to leech into aquatic ecosystem through the outflow of liquid wastes from wastewater treatment plans, factory farms lagoon and/or urban runoff. EDCs have the potential to disrupt the synthesis, secretion, transport, binding, and/or the elimination of natural hormones. Hormones are critical aspects required for normal development, reproduction, and homeostasis. This project examined changes in behavioral responses following long-term exposure of male and female fathead minnows (*Pimephales promelas*) to environmentally relevant concentrations of EDC mixtures representing urban and agricultural pollutants found in the Great Lakes watershed. As nitrate is also commonly found in this aquatic environment, it was used as a secondary stressor at two environmental concentrations. This exposure took place over the span of three fathead minnow generations with fish behaviors being recorded for the first two generations. The behavioral videos closely examined nest defense, boldness, and courtship of the fathead minnows. Changes in fathead minnow behavior could impact wild populations altogether because, for example, nest-protective behaviors tend to positively correlate with egg production. Changes in these behaviors may explain decreases in reproduction found in the aquatic environment.

**Abstract Code:** P20

**Presenter(s):**

Alex Maile

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Body Shape Changes Across Habitat Transitions in Lizardfishes (Aulopiformes)

**Abstract:** The lizardfishes and their allies (Aulopiformes, ~282 species) are investigated from a geometric morphometric approach to study the evolution of body shape changes across habitat transitions in this lineage of fishes. No previous studies have quantitatively examined changes in body shape across lizardfishes and their allies. Over 400 lizardfish specimens were digitized that included representatives from every family of these fishes. We identify that there are distinct patterns of body-shape change across the lizardfish radiation. Body shape trends of “cigar-shaped” are dominant in inshore and deep-sea benthic habitats while trends towards being elongated and a posterior position of the dorsal fin, reside in deep-sea lizardfishes (e.g. Alepisauridae, Lestidiidae, Notosudidae) with an exemption in Scopelarchidae, which exhibits a more cigar shape trend. This is the first study to document significant body shape changes across marine habitat transitions from coral reefs to the deep sea and has implications for the life history and biology of these fishes.

**Abstract Code:** P21

**Presenter(s):**

Emily Neuman

**Faculty Mentor(s):**

Matthew Julius

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** You Are What You Eat: Impact of Food Quality on Fatty Acid in Fish

**Abstract:** I want to conduct an experiment varying the diet in fish to examine how food quality affects stored lipid composition in sunfish. Over a 20 day period Sunfish, *Lepomis macrochirus*, will be feed pellets produced using two distinct species of algae. These are *Cyclotella meneghiniana* (a diatom) and *Haematococcus pluvialis* (a green algae). The diatom is rich in omega 3 fatty acids and the green alga is carbohydrate rich and fatty acid poor. The hypothesis is that the fish's fatty acid composition will reflect the fatty acid composition in its diet with minimal restructuring metabolically. At the end of the 20 day feeding period several metrics will be measured and compared. Most notably, total lipids and lipid composition will be quantified and compared. This will provide the data required to corroborate or falsify my hypothesis. This project has a single primary objective. The primary objective demonstrates that food quality, specifically fatty acid composition in food, has a dramatic impact on the fatty acid composition of animals eating the food, in this case, the two different strains of algae. I am predicting that specific lipid classes will carry over from food to consumer with profiles that correspond directly to one another.

**Abstract Code:** P22

**Presenter(s):**

Hailey Richards

**Faculty Mentor(s):**

Mili Mathew

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Auditory Perceptual Judgement of Disordered Speech Characteristics- Is it a necessary or essential clinical skill?

**Abstract:** The field of speech-language pathology, relies heavily on the the ability of a speech-language pathologist (SLP) to be able to detect disordered speech. Identification of disordered characteristics often leads to a diagnosis of the communication disorder and even provides an estimate of the severity of the disorder. In order to do this, a clinician must posses a skill called auditory-perceptual judgment (APJ). Although APJ is considered an important skill for an SLP to possess, there are shortcomings; a) this is a subjective tool, which can vary based on the experience and academic/clinical training of the SLP; b) listener agreement and reliability often varies when judges/SLP's listen to speech that varies in severity. Furthermore, graduate students enrolled in SLP programs are expected to develop and hone this skill as they begin to see clients with communication disorders in their clinical practicum. It is often assumed that at the end of their internships they will be SLP's who will have competent APJ skills. This is due to the perception that an SLP's years of exposure and practice positively correlate with their auditory perceptual skills. The present study will explore the effects of providing listening training to first-year graduate students enrolled in the Communication Sciences and Disorders (CSD) program at SCSU. The training program, which will be developed as part of this project, will focus on disordered speech characteristics commonly observed in communication disorders such as dysarthria, voice and fluency. The results of the study will help the researchers understand the appropriateness of providing a short term program and evaluate if this training will indeed lead to improved auditory perceptual skills among student clinicians. It will also help researchers evaluate the effectiveness of the newly developed listening training program



**Abstract Code:** P24

**Presenter(s):**

Swapnil Acharya, Md Ali Asif

**Faculty Mentor(s):**

Ling Hou

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** My Voice

**Abstract:** Abstract:A device that could translate sign language hand gestures into speech would allow people who cannot speak or hear to communicate with people who can speak and hear properly. A wearable glove consisting variety of sensors like flex, accelerometer, gyroscope and contact was designed to detect hand gestures and finger positions. The data collected from these sensors were sent to a graphical user interface which collected this information to make a Lookup Table. This Lookup Table was then used to train a machine learning algorithm which, later was able to predict the hand gesture currently made using this glove. The predicted letter was made audible using text to speech conversion. Project Description:Communication is an integral part of human life. However, this process is challenging for those who cannot speak or hear properly. Sign language is essential part of life for those who cannot hear and speak properly. The objective of this project was to design a device (glove) that detects American Sign language (alphabets only) gestures and then translates these gestures into audible alphabets, which can be used to facilitate communications among people who only speak sign language or between people who speak language and people who speak. A Glove consisting of variety of sensors was designed to accomplish this goal. The flex sensors in this glove were used to measure the bentness of fingers, the contact sensors were used to distinguish between letters which had the same bentness. Accelerometer and Gyroscope will be used to measure motion and orientation of the glove for some ASL letters.The data collected from these sensors were sent to a graphical user interface which collected this information to make a Lookup Table. This Lookup Table was then used to train a machine learning algorithm which, later was able to predict the hand gesture currently made using this glove. The predicted letter was made audible using text to speech conversion.

**Abstract Code:** P25

**Presenter(s):**

Chase Negen

**Faculty Mentor(s):**

John Sinko

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Influence of Surface Roughness and Reflectance for Aluminum Space Debris Removal

**Abstract:** The accumulation of space debris has been a rising concern due to the risk of triggering Kessler syndrome. Laser based removal systems offer an efficient solution for aluminum debris, and numerous studies have been conducted regarding the ablation process, as it relates to space debris removal. However, little activity has been directed towards the reflectance of aluminum debris with varying surface conditions, which is a significant physical property with regards to laser ablation. This paper investigates the reflectance of aluminum samples with varying surface roughness when a pulsed 1064 nm Nd:YAG laser was directed at normal incidence upon the aluminum samples. For in-air tests, the aluminum was inlaid into an insulation block, and a thin wire thermistor was inserted into the side of the sample and used to measure the change in temperature. With the temperature and beam energy measurements, the reflectance of the sample was then calculated using the specific heat equation. It was discovered that a lower surface roughness yielded a considerably lower reflectance, with the reflectance varying from 50-90%. This indicates that the surface roughness of aluminum space debris would substantially alter the laser interaction in a debris removal scenario.

**Abstract Code:** P26

**Presenter(s):**

Matthew Thomas

**Faculty Mentor(s):**

Kevin Haglin

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Fate of the Milky Way Galaxy

**Abstract:** Using applied mathematics and physics, we seek to formulate a mathematical model for the orbits of objects around a galactic center taking into account momentum loss from radiation. As a star orbits around the galactic center it is constantly radiating light in all directions, this combined with the motion of the star results in it slowing down or potentially speeding up. We have used concepts in astrophysics alongside mathematics to formulate a model to predict the orbits of stars as a result of this effect.

**Abstract Code:** P27

**Presenter(s):**

Jessica VanderWerf

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Hero? Victim? Person.

**Abstract:** What does it mean to be disabled? Why does society categorize people with disabilities? What occurs with categorization? This research project explores the categories looking in at a global scale. Examining the world of people with disabilities and why people with disabilities might feel the need to hid their condition with examples from history.

**Abstract Code:** P28

**Presenter(s):**

Nina Duffeck

**Faculty Mentor(s):**

Jill Andel, Margaret Glazer

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Adolescent Depression Education in Public Middle and High Schools

**Abstract:** This paper explores the reasons why American public schools should implement adolescent depression education into the curriculum of their middle and high schools. The research compiled seeks to explain the necessity for such education, benefits, and drawbacks of the curriculum implementation, as well as the problems that could arise when attempting this kind of change. Mental health issues have been present in adolescents for a long time and adults often still struggle to give these youths the proper resources and care. These findings fuel the discussion of whether or not public schools currently do enough to provide proper services to their students. The research also aids in discussing how they can continue putting the needs of students first and what that might look like in the future.

**Abstract Code:** P29

**Presenter(s):**

Kaylee Jatkola

**Faculty Mentor(s):**

Cindy Gruwell, Phillip Godding

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Shaping a Serial Killer

**Abstract:** This project will analyze and describe different aspects that may mold what we know as, serial killers. A serial killer is someone that commits a series of murders for no profound reason, and has a common modus operandi. What do serial killers have in common? Similarities can include behaviors, personality traits, childhood trauma, and much more. There are several specific traits that correlate with most serial killers. Impulsivity, the need for control, and lack of empathy are just few examples of their reality. This research will provide facts, and explanations for serial killers and the nature of their essence.

**Abstract Code:** P30

**Presenter(s):**

Shelby Goebel

**Faculty Mentor(s):**

Cindy Gruwell

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Math is for Everyone!

**Abstract:** Mathematics is not an easy subject. To some it comes so easy, and to others it is frustrating- especially students with disabilities. If current teachers or future teachers knew of some strategies or ideas to help those students out, then maybe, math would be fun for everyone. Mathematics is a subject that will be used in everybody's day to day life. If we as educators are familiarized with the best of the best ideas then we will be ready to help students with whatever they may be struggling with. This research will be focusing on current strategies, learning styles, interventions, games, etc. for teaching mathematics to K-8 students with disabilities.

**Abstract Code:** P31

**Presenter(s):**

Andrew Wendorff, Zachary Waytashek, Riley Ziermeier, Tyler Hirsch

**Faculty Mentor(s):**

Nancy Sundheim

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Midsota Manufacturing Facility Layout

**Abstract:** We are complete a analysis of the production of the parts department at Midsota trailer. We then will be constructing a facility layout for a proposed addition to Midsota's new building. It will be of a 80' by 220'. Other focuses will be storage optimization and organisation. Currently Midsota is experiencing rapid growth which has caused growing pains. we plan on having time study of the fork lift travel, material flow charts.



**Abstract Code:** P32

**Presenter(s):**

Kylee Timperley

**Faculty Mentor(s):**

Alvin Yu, Cindy Gruwell

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Medical Tourism: The Healthcare System of the World

**Abstract:** The purpose of this paper is to attempt to better understand medical tourism with its recent surge in popularity. Medical tourism is not in and of itself a new idea or phenomenon, having ancient traces back to the Greeks and Egyptians. However, while it may not be a new idea for humankind it is new in the context of modern-day societies. By researching medical tourism more, we are able to make progress towards obtaining a general consensus of whether medical tourism is good or bad. In addition, we are able to implement necessary laws and regulations in order to mitigate or avoid the potential negative effects of medical tourism.

**Abstract Code:** P33

**Presenter(s):**

Mariah Alipate

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** 13th Amendment

**Abstract:** What I plan to do is give my presentation on the 13th amendment and how it has changed the world for the better but at the same time bring awareness of although yes it has helped our country there is still discrimination and lots of other things going on.

**Abstract Code:** P34

**Presenter(s):**

Edwina Keta

**Faculty Mentor(s):**

Cindy Gruwell, Mumbi Mwangi

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** False Advertisement of Crisis Pregnancy Centers in the Midwest

**Abstract:** This research paper aims to investigate the false advertising that crisis pregnancy centers use in order to deter people from accessing comprehensive and accurate information about reproductive and sexual health. In addition, it will explore the significant impacts they have on vulnerable groups in the United States. These fictitious health centers, also known as pregnancy resource centers or fake women’s health centers, are medically unlicensed but state and federally funded establishments. One of their primary missions is to mislead women from choosing abortion by mimicking legitimate family health and abortion clinics. This paper explores a better understanding of the historical development of these centers as a political device in relation to the Supreme Court decision of Roe versus Wade. In addition, they target vulnerable communities of the United States with the pseudo-promise of support and truthful information about reproductive and sexual health. Furthermore, the paper intends to reveal that although there are some benefits through the services they provide, their overall pro-life agendas restrict patients from weighing accurate health alternatives and exercising the right to choose for themselves. Ultimately, the intention of this research is to expose readers to the influences of crisis pregnancy centers and inform them about different methods used to decipher between legitimate and fictitious centers through their advertisements.

**Abstract Code:** P35

**Presenter(s):**

Julimar Rodriguez, Ashley Hauer

**Faculty Mentor(s):**

Yuh-Jen Guo

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Facebook, Anxiety, and Adaptability in American College Students

**Abstract:** Facebook, as a social media network, affects the lives of college students, especially in their first year. The transition from high school to college, becoming an independent young adult, academic stress, and managing interpersonal relationships are to name a few critical stressors which often put a tremendous pressure to impact college students' wellbeing. Mental health concerns run high on today's college campuses. Students who suffer from stress coming from multiple fronts are likely to drop out from colleges, fail classes, and even develop a mental disorder or turn to maladaptive coping mechanisms such as substance use. With the thriving of social media, it becomes a force to both support and damage college students' coping effort against all stressors (McCord, Rodebaugh, & Levinson, 2014). Previous studies have found a significant relationship between frequent social media usage and adaptability of international students; such is the case of research that concluded that social media usage results in higher levels of social and academic adaptation in Chinese international students in the United States (Forbush & Foucault-Welles, 2016). Facebook could be better used to improve the mental health conditions of college students and their academic performance. This study takes a different approach to examine American college students and the impact of Facebook on individual adjustment and anxiety. It attempts to further explore the impact of social media use on college students and continues to help service providers understand what college students are facing in the current social environment.

**Abstract Code:** P36

**Presenter(s):**

Amber Wieberdink, Alyssa Mussehl

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Stearns County Re-Incarceration Rate for DWI Probation Data

**Abstract:** County jails, probational agencies, and even the probation supervising agents are extremely interested in how well their probation and parole works in reducing the likelihood an individual reoffends. Essentially, how effective they are in cutting down rates of recidivism. Stearns County asked this question specifically for their clients that were on probation for DWIs in 2013 and 2014. Our research question was “Are Stearns County supervision practices effective in reducing re-incarcerations within 3 years of the client’s close date?” and we were asked to look at a 3-year time frame from the probation close date. We answered this question using observational data from the state (jail data) and county (probation data) to find the re-incarceration rate of the clients on probation for DWIs within the time frame given. We were also asked to investigate any patterns of the clients that were re-incarcerated within that time frame. We set the time frame based on the date that the probation for the original offense was completed. What we found was that there were 141 clients that were re-incarcerated within the 3 years of their closed probation date and 376 that were not. This gave a re-incarceration rate of 27.3% for DWI probation. There was a wide range of offenses that led to re-incarceration however some of the most common ones were DUI/DWI’s and Driving After Cancellations, as well as assault and domestic assault. We defined effective supervision practices as having less than 30% for a re-incarceration rate. Therefore, we deemed Stearns County supervision practices as effective in reducing the amount of re-incarcerations within a 3-year time frame after their probation was closed.

**Abstract Code:** P37

**Presenter(s):**

Olivia Mikkelson

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Communicate Effectively

**Title:** Positive and Negative Affectivity Impacting Communication in Newly Married Couples

**Abstract:** I am interested in researching how positive and negative affectivity affects communication in newly married couples. I intend to deeply investigate affectivity and learn more about how it impacts communication. I am interested in the psychology behind communication in newly married couples and intend to learn more about how affectivity plays a role in communication of the couple during the crucial time in the relationship. Positive and negative affectivity refers to a person's natural preference to experience positive emotions or negative emotions. Their affectivity defines how they interact in life which includes life's challenges and relationships. If a person has more negative affect, they may experience the world in a more negative way. If a person has more of a positive affect, they will interact in their life with a positive view. I hope to find out why affectivity and communication play important roles in newly married relationships. I am interested in researching how affectivity has an impact on newly married couples, as they are going through many changes together. I intend to investigate how communication plays a role in this stage of a relationship as the couple is discovering new experiences together.

**Abstract Code:** P38

**Presenter(s):**

Justin Baumgarten

**Faculty Mentor(s):**

Mark Minger

**Husky Compact Dimension:** Communicate Effectively

**Title:** The Muskellunge Stocking Controversy of Lake Minnetonka

**Abstract:** Abstract: “The Muskellunge stocking controversy of Lake Minnetonka” By: Justin Baumgarten Minnesota is commonly known as the “Land of 10,000 lakes” which presents the citizens of the state and tourists with an almost unlimited amount of water activities. Fishing is at the forefront of these activities. Lake Minnetonka has an area of approximately 14,205 acres, and is located in the west metro of Minnesota. In 1974, the Minnesota DNR began stocking the waters with Muskellunge. Muskellunge are an apex predator in freshwater. This study was done to find out if anglers believe the DNR should continue to stock Muskies in Lake Minnetonka. This survey was completed in order to find out opinions various anglers have on the stocking program designed by the DNR. It focused on the positive and negative thoughts the anglers had in relation to the effects Muskies have on the ecosystem of Lake Minnetonka. Questions on the survey were designed to figure out the demographic of the anglers, and their angling intentions for fish species. Many anglers choose to primarily target muskies on the lake, while other anglers believe it negatively affects the other fish species. There was a total of 50 anglers that took the survey and the results showed that there were mixed feelings on the stocking program. While many anglers believed that the Muskie population is negatively affecting the various other species of fish, majority were for the stocking.

**Abstract Code:** P39

**Presenter(s):**

Allison Sinner, Muuzaani Nkhoma, John Blee

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Communicate Effectively

**Title:** Are Supervision Practices Effective in Reducing Re-Incarceration in the State of MN?

**Abstract:** Stearns County Community Corrections is responsible for ensuring a safe and friendly environment for its community. This is important because it was found that the majority of clients who were on probation for a domestic offense were incarcerated again for a domestic related offense. Stearns County is interested in finding out if and how they can reduce these re-incarceration rates. An exploratory data analysis approach was used to determine if Stearns County's supervision practices are effective in reducing re-incarcerations in the state of Minnesota. Clients who were put on probation for domestic offenses are contained in a dataset for the two-year period between January 1, 2013 and December 31, 2014. Clients who were arrested during the three-year period between January 1, 2015 and December 31, 2017 are contained in the Statewide Supervision System dataset. Our job was to see if those probation clients showed up in the Statewide Supervision System dataset, meaning that these probation clients re-incarcerated after their domestic probation cases closed.



**Abstract Code:** P40

**Presenter(s):**

Andrea Langhoff, Brandon John, Johanna Severson

**Faculty Mentor(s):**

Patricia Bodelson

**Husky Compact Dimension:** Communicate Effectively

**Title:** Cartographic Multicultural Teaching Material Design

**Abstract:** The poster presentation will be one of presenting the development of children’s experiential educational cartography. Its purpose is to teach diaspora children in Greek refugee camps about the safe responses to earthquakes. Because seismic activity is a prevalent and new potential occurrence for the children, they should be prepared for the event emotionally and physically. This pamphlet is an attempt to do that while engaging them in cognitive and fine motor activities. External funding is being sought for printing materials and accompanying accessories.

**Abstract Code:** P41

**Presenter(s):**

Bryan Burnell

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** How and Why Does Income Tax Fluctuate from Person to Person in the United States, Egypt, and China?

**Abstract:** Since income tax varies between different people in the same countries as well as different countries, it would be appropriate to find the causes and explanations as to why this happens. There are actually many factors that cause this variability. Different structures of government is one factor that varies in these different countries. United States has a democracy and it favors the people, which is better for economy and taxes. In Egypt, has more of a republicanism style of government. They are fairly new this style of government because they had a huge revolution about a decade ago. In China, they have a People's Republic of China, which is exercised by the Communist parties in China. Since it is a Communist country, they tend to distribute the wealth evenly to all the people in China. There is not much variability in income taxes between people in China because of the Communist party. Different amounts of income impact the variability in these countries too. United States generally have an average income higher than the other two countries, so their income taxes will be much greater compared to people in China and Egypt. All these factors and more impact the different amounts of income tax applied to different people in these countries.

**Abstract Code:** P42

**Presenter(s):**

Nathan Block

**Faculty Mentor(s):**

Geoffrey Tabakin, Traci Anderson

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** The Evolution of the Stigmatization of Autism Throughout Modern US Education

**Abstract:** Stigma surrounding mental illness has been increasingly visible in the past few years especially after tragic events. The power of stigma affecting those diagnosed with mental illnesses, especially Autism, starts in early education and continues for the rest of one's life. While the stigmas about students with Autism experience may vary little as they grow older, other's stigmas about them change greatly, from different or special to the extremes of incompetent or undeserving of equality. The responses and observations of stigmas of Autism lend great support to the pervasiveness of stigmas and results in perpetuating their continued existence in society and shows an increasingly negative connotation as fellow students become aware of the mental illness that peaks around high school. An important note about the data showed a decrease in stigma for those in close and personal contact with Autism and those who took classes covering stigmas of mental illnesses which explains the decrease in strength of the stigma after high school.

**Abstract Code:** P43

**Presenter(s):**

Calista Bulacan

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Infant Mortality Rate in Afghanistan vs the United States

**Abstract:** The infant mortality rate in the world has been continuously decreasing. However, there are significant outliers where the individualized infant mortality rate is higher than other areas. Afghanistan has the highest infant mortality rate at 110 deaths per 1000 live births. This is in high contrast to the familiar culture of the United States in which there are only 5.8 deaths per 1000 live births. The compare and contrast between these countries presents many questions as to the causation behind these numbers. Some of the questions that need to be addressed is the effect of culture on the process of birth. Also a look into maternal diet, maternal deaths pre-birth, and cultural practices would further the investigation. Also post-birth there are more factors to take into account. This includes things like the diet of the baby, the involvement of the father figure and how the baby is given care. Besides the mother and baby who are directly involved, there also has to be a medical aspect. How the doctors and nurses participate in birth, the environment the birth is in and the vaccinations the babies get before the age of one may also have some effect.

**Abstract Code:** P44

**Presenter(s):**

Maria Burns

**Faculty Mentor(s):**

Cindy Gruwell, Mark Jaede

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Jazz and Blues in the Civil Rights Movement

**Abstract:** This paper will explore the history of jazz and blues music during the civil rights movement. Specifically the musicians of the civil rights movement, the challenges they faced and what it meant to be a musician during the time of such racism and oppression. What was the significance of jazz and blues and what did they mean to the people during this era of strife and turmoil? In addition, special attention is given to how the music changed those who wrote and sang it.

**Abstract Code:** P45

**Presenter(s):**

Sergio Guerrero

**Faculty Mentor(s):**

Yuh-Jen Guo

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Latinx Attitudes Toward Seeking Counseling as a Result of Cultural Values: Implications to the Counseling Field

**Abstract:** Mental Health Stigma (MHS) has been identified as a prominent barrier to seeking treatment (Sickel, Seacat & Nabors, 2014). MHS is especially present in ethnic minority populations (Gary, 2005). The purpose of this study is to examine the relation between cultural values and attitudes toward seeking counseling within the Latinx community in a university setting. Procedure: Participants will be interviewed following a semi-structured interview protocol developed based on an in-depth literature review and the support and feedback of a qualitative methodology expert. The sample size will be developed according a theoretical and purposeful sampling method which will continue until reaching saturation of the data. Each interview will be recorded and transcribed verbatim before the data analysis. Data analysis will follow a six phases thematic analysis methodology (Braun & Clarke, 2006), following an inductive approach to data. This phenomenological constructivist approach provides the participants with the liberty to express their emotions, thoughts, and ideas in a non-restrictive and yet guided manner. Results/expectations: The researcher expects that the cultural values that the Latinx community holds could potentially be a reinforcer toward the stigma that already exists toward mental health and the utilization of their services. Implications: the study will enable to gain a deeper understanding in the relationship that exists between the Latinx community and the Counseling field. In addition, the study will contribute to the existing research and literature.

**Abstract Code:** P46

**Presenter(s):**

Dolly Her

**Faculty Mentor(s):**

Yuh-Jen Guo

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** The Influence of Attachment Style in Hmong College Students' Help-Seeking Behavior

**Abstract:** Many Hmong college students come from families which came to the United States as refugees due to the Secret War that ended in 1975. There are a lot of stigmas tied into the Hmong culture about mental health that prevents this population from reaching out for mental health help. Vang (2010) found that Hmong youths' perception of mental health stigma had a positive correlation to their family and own Hmong community's stigmas of mental health. These stigmas still exist today and prevent Hmong students to seek for professional mental health help. It is known that the differences in cultural values and language barriers have block Hmong students from the essential mental health services. Current research also shows that attachment style does have an influence on one's help seeking attitude. IRKÖRÜCÜ and DEMİR (2015) found that those with a secure attachment style were more likely to have a positive attitude towards help seeking than those with a preoccupied or fearful attachment style. While Hmong students are inevitably impacted by college life and its stressful lifestyle, their mental health help-seeking behavior may determine their well-being on campus. With little to no literature to study the relationship between attachment style and help-seeking behavior of Hmong students, it is imperative to conduct this research with this population. Therefore, this study will aim to explore whether or not attachment style has an influence on help-seeking behaviors among Hmong college students.

**Abstract Code:** P47

**Presenter(s):**

Rebecca Jimenez

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Brexit- The Effect on Nursing

**Abstract:** For my project I will be going over how Brexit affects the healthcare field, specifically nursing, and how it can/has been changing the future of nurses and their patients. Brexit has a large impact on the nursing career. Nurses are high in demand and short staffed in the first place, but according to the Department of health after Brexit the NHS (Nursing and Health Studies) could have a shortage up to 42,000 nurses by 2026 if immigration laws are altered. With such shortages already, nursing quality of care would suffer, and in result patients would not have the quality of care they deserve because of these shortages. In relation to my project, while abroad I will be interviewing staff at the Alnwick infirmary and will be getting their perspective on Brexit, the work environment, their predictions of the future in healthcare, and how it has already affected their work life.



**Abstract Code:** P48

**Presenter(s):**

Jonah Marietti

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Brexit & Its Impact on the Book Industry

**Abstract:** For my project on the effects of Brexit I am looking into the book industry and the changes Brexit will bring to importing and exporting books of literature. This research will involve looking into the publishing industry in Britain and how this change will affect books and authors from the nation and what it will mean for us from across the pond: how will book deals, sales, work out between Britain and the U.S. and deals made with other European countries? The side-effects and consequences, which govern the current status quo on books being published and dispersed between the UK and the rest of the world is a topic of interest to me, and I believe it is important for authors and other writers who intend to sell their product, whether they live in the UK or outside of it; it effects the literature world. How will it affect the authors in Britain is a dual topic which I will address alongside with the publishing industry as they both share the same outcome from Brexit. This project will involve looking into the businesses of book publishing and dispersing, and how these common practices may be affected from Brexit.

**Abstract Code:** P49

**Presenter(s):**

Mu Soe

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** The Impact of Primary Schooling on Karen Refugee Students' in St. Paul, MN Enrollment in the Institutions of Higher Learning.

**Abstract:** Karen people are from Southeast Asia and not many know this group of people. This group of people arrived in the US not too long ago and Minnesota is home to the largest concentrated population of the Karen people. This study surveys a group of Karen refugee students who went to primary school in St. Paul, MN and a group of Karen refugee students who went to a primary school before coming to the USA living in Saint Paul, Minnesota. There are 20 participants in total. The question that my project is looking to answer is how does primary schooling affect the enrollment of Karen refugee student into college? I used both qualitative and quantitative method to compare and contrast the two groups. I hypothesize that Karen refugee students who went to primary school in the United States will have a higher rate of enrolling in college then the Karen refugee students who went to a primary school before coming to the USA.

**Abstract Code:** P50

**Presenter(s):**

Hser Poe

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Immigration to America: Differences in Cultural Assimilation between Older and Younger Karen Adult

**Abstract:** Immigrating to a new country and starting a new life is challenging and often met with struggle. It can also be fun and exciting to learn new things and have a better life after immigrating. Many people in the United States are immigrants and there are many reasons why they are immigrating to a new country that offers better opportunity in contrast to the country they immigrated from. As people settle in a new country, they are required to learn the common language, and may feel they are required to practice the dominant culture which immigrants slowly adopt while trying to keep their own culture. In the United States, there are growing numbers of Karen people from SE Asia living throughout the 50 states and there are more than 17,000 of them living in Minnesota. This study analyzed two different age groups of Karen immigrants (young adults and older people) and how they maintain their cultural practices as well as the difference in level of assimilation between the two different age groups. This was found out through online surveys for younger Karen and translated written paper surveys for older Karen. There were twelve young adults and ten older adults who took the survey. I found that generally the younger group was more assimilated than the older one.

**Abstract Code:** P51

**Presenter(s):**

Pang Yeng Lee

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Hmong Concepts of Herbal Medicine, Shamanism, and Healing

**Abstract:** As modern medicine becomes available everywhere in today's globalized world, many traditional cultures still find it difficult to accept it. One such traditional group, the Hmong people, still depends on ancient herbal medicine and rituals for healing. The Hmong are among one of the largest immigrant groups in St. Paul, Minnesota. Despite a long presence in the USA, their daily culture still has a strong reliance on herbal medicine and healing rituals. The purpose of this research is to understand diverse perspectives as I survey doctors/nurses and the Hmong people in the Twin Cities area. There is a total of 70 surveys that are hand out to three different groups. The research surveys 60 Hmong people with four follow up interviews of both young and older people about their perceptions and practice of modern medicine. I also survey 10 nurses/doctors on whether or not they struggle with convincing a Hmong patient to rely on modern medicine. I find that Hmong people choose to rely on traditional medicine, even when the modern alternative is available. This suggest an example of cultural resilience, an unusual trait in the generally diffusing globalized world of today.

**Abstract Code:** P52

**Presenter(s):**

Taylor Twardowski

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Language and Global Connection: Do Minnesotan College Students Find Value in Learning an Additional Language?

**Abstract:** As the world continues to grow and connect, via business, social media, education, travel, and more, the way we connect and communicate with others is continually evolving. Global languages are reaching deeper and are becoming more familiar, and languages bring members of diverse and multicultural world together. In my research I am analyzing the value that college attending students in Minnesota place on learning an additional language to better compete and engage on the global stage. I hypothesize that these students will be the individuals who want to better connect, politically, culturally and professionally, with the global world. However, I also analyze if people find value in learning an additional language in more of a domestic setting and if they think it will help them compete more effectively than other students like them. Though an online survey of college students from different Minnesotan universities, I found that the students who wish to become more of a globalized citizen are more likely to find value in an additional language, while domestically, people will be aware that in our diversifying communities additional languages will be present and become more prominent in the upcoming generations.

**Abstract Code:** P53

**Presenter(s):**

Tessa Takash

**Faculty Mentor(s):**

Mikhail Blinnikov

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** What Makes us Happy? An Examination of Happiness in Global Contexts

**Abstract:** Humanity's eternal question is to find the meaning of life, and many believe the answer is simply to be happy. That proposes the question: what exactly is it that makes people happy? This study explores the factors that contribute to people's happiness whether they be political, economic or social. Examples of circumstances in these categories include stable government; accessible education; a high Gross Domestic Product; low unemployment; and strong ties to one's community. By comparing these factors among countries that rank both at the top and near the bottom of the United Nations World Happiness Report, the study examines the balance of factors that lead countries to report high levels of happiness. Cultural contexts and societal definitions of happiness also play a large role in determining whether citizens of a country consider themselves to be happy. There also are specific factors that certain societies deem as more important for a happy, fulfilling life. Through oral interviews with citizens from countries around the globe (such as Chile, the United Kingdom, and Costa Rica), this study investigates cultural nuance and context when defining and reporting happiness.

**Abstract Code:** P54

**Presenter(s):**

Kevin Gruwell

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Encouraging Personal Student-Professor Relationship Development Through the Internet

**Abstract:** The use of the internet and internet-related services in academia has drastically changed the ways in which students and professors communicate. In class, professors can use online resources as supplementary materials to their lessons and can facilitate class activities through an online medium. Outside of class, professors can post class information or assignments on a website and give students access to view this information whenever they choose to do so. The internet also allows for easier communication between student and professor through the use of email and social media. Finally, the internet allows for the existence of purely online classes, which allow professors to teach outside of what would be considered to be the typical face-to-face structure. As a result of these changes, the relationship between student and professor has evolved to become more personal and not focused strictly on academics. This project will explore the ways in which the internet has changed communication in order to allow for a more personal relationship to develop between a student and a professor.

**Abstract Code:** P55

**Presenter(s):**

Claire Shea

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** The Effect of Homeopathic Medicine on Allopathic Medicine

**Abstract:** Homeopathic medicine has dated back to the nineteenth century when the prescribing of alternative medicines began. Homeopathic medicine dates to Native Americans and other indigenous people worldwide. The belief that small doses of naturally occurring bacteria, herbs, and plant life has driven the practice into its present form. The practice of homeopathy is continuously debated between medical professionals of all disciplines. The simplicity and holistic ideals of homeopathic medicine have prompted questions concerning the practice of Western Medicine, also known as allopathic medicine. These two forms of medical practice have the power to alter a human life in both positive and negative ways. The homeopathic approach has been claimed to utilize the placebo effect for its positive effect, while the allopathic approach has been claimed to prescribe potent drugs without proper consideration. The two contradicting views challenge each other in the goal to improve the quality of human life. Homeopathic medicine is continuing to become more prevalent in the United States and its controversial treatments raise concerns and innovation for the entire medical field.



**Abstract Code:** P56

**Presenter(s):**

Kyle Dawson

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Aquatic Sports and their Influence on Spectation and Pep Music

**Abstract:** I will be researching how the increase in number and popularity of aquatic sports will affect the future of spectator sports as well as pep music at sporting events. Some certain aspects I will be addressing more in-depth are spectation and popularity of aquatic sports such as underwater hockey and underwater musical instruments or groups such as the band Aquasonic. This project combines my General Chemistry and Husky Sports Band classes.

**Abstract Code:** P57

**Presenter(s):**

John Palmer

**Faculty Mentor(s):**

Cindy Gruwell

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Short Form Media in The Digital Age

**Abstract:** The importance of television on the sphere of media is undeniably huge. Through it, some of the most beloved pieces of culture have been brought to existence, and have helped expand film overall. Television itself is part of a larger art form known as "Short Form Media", defined by Merriam-Webster as "denoting or relating to the content of a type that is short in length or duration, designed to be read or viewed quickly.". However, with a new medium on the rise, television may be put into jeopardy in its monopoly of short-form entertainment. This medium is free streaming platforms, most notably Youtube and the live video streaming platform Twitch. Through both of these, there is no limit to what people can upload, and there are no restrictions from a network. Because of this, content creators can freely express themselves online and at extreme ease. However, because these mediums have been around for a shorter period of time, they are considered less reliable compared to television. The largest difference that both of them provide, however, is accessibility. Currently, free video platforms have more accessibility as almost every service has a mobile app, but television networks are slowly expanding into the areas of streaming networks as well, providing screen-time competition for these platforms.

**Abstract Code:** P58

**Presenter(s):**

Ryan Herr

**Faculty Mentor(s):**

Satomi Kohno

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** "Does Contaminated Wastewater Affect Estrogen Receptors in Baitfish Populations?"

**Abstract:** Contaminated stormwater and snow-runoff, which is found in many municipalities, has been found to contain pharmaceuticals, specifically substances which are considered to contribute to the disruption of hormones which affect aquatic life. These pharmaceuticals have been associated with an affect on the natural gender spread of many aquatic species. The specific species under study is the common fathead minnow, and how it is affected by estrogen-affecting pharmaceuticals. Objective: Our objective is to understand how the pharmaceuticals, especially hormonal disruptors affect the aquatic wildlife and its implications on species' reproduction and survival, as well as their interactions with estrogen receptors. Hypothesis: Higher contaminated stormwater and snow runoff will be associated with a higher degree of hormonal and physiological disturbances in the fathead minnow population. There will also be a higher amount of estrogen-inducing pharmaceuticals in wastewater and runoff in areas where more individuals are affected. Potential outcome: A potential outcome of the study would hope to support or not support our hypothesis of contaminants' role in organisms. A potent outcome would also involve determining best are the practices for treatment of contaminated storm water and snow runoff. Potential applications: Some applications of the study would include reducing the number of volatile pharmaceuticals in wastewater and runoff, increased understanding of sex determination in earlier animals, as well as learning the estrogen receptor's evolution as a sex-determining hormone in embryonic aquatic species.

**Abstract Code:** P59

**Presenter(s):**

Samuel Ellis

**Faculty Mentor(s):**

Christopher Kvaal

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Construction of a Fluorescent *Listeria innocua* strain for Use in Food Safety Laboratories

**Abstract:** Following state and federal guidelines, certain manufacturers in the food industry must test their products for bacteriological contamination. Many of the food testing laboratories performing these tests routinely test for the presence of *Listeria monocytogenes*, the causative agent of the foodborne illness listeriosis, by growing reference strains of the species for comparison. Risks of using these reference strains in the laboratory include the potential for cross-contamination, leading to false-positive identifications as well as accidental exposure to pathogenic microbes. Engineering the nonpathogenic sister-species *L. innocua* with green fluorescent protein can lead to a safe and efficient method of confirming cross-contamination by use of an easily identifiable surrogate. The purpose of this study was to engineer a strain of *L. innocua* with the green fluorescent protein gene (*gfp*) integrated into the chromosome, allowing stable visual fluorescence. The integrative plasmid pPL3e containing PSA phage-integrase, erythromycin resistance gene, and Hyper-SPO1 constitutive promoter fused to the *gfp* gene was integrated into the chromosome in a site-directed manner. *Listeria innocua* NCTC 11288T cells were made electrocompetent and electroporated with 1 µg plasmid DNA. These cells were recovered for 24 hours at 37°C on BHI media containing 5 µg/ml erythromycin. Transformants were visualized with 440-460 nm LED light to confirm fluorescence. Integration of the cassette into the chromosome was confirmed by molecular analysis including PCR and genome sequencing. Stability of the integration was confirmed by 100 generations of growth of the transformed strain in nonselective media, followed by a switch to selective media containing erythromycin, whereupon 108/108 clones of the transformed strain retained antibiotic resistance and visual fluorescence. This engineered strain of *L. innocua* emits fluorescence visible by the naked eye, making it a useful tool for food testing laboratories to quickly and safely determine whether samples have been cross-contaminated by the reference strain.

**Abstract Code:** P60

**Presenter(s):**

Mackenzie Forseth, Kong Yang, Jordyn Brandt, Scarlett Cheong, Sophia Su, Miraf Molla

**Faculty Mentor(s):**

Louise Millis

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** The Power of the Seq

**Abstract:** In Fall 2017 and Spring 2018, bacterial samples that produced antimicrobial properties were collected from soil samples and characterized based on their physical and chemical properties. While this process enables us to learn about these organisms, it is not always successful at identifying the bacteria, especially if it is not common or it has not been discovered. In the cases where the bacteria is new and has not been discovered, DNA sequencing can be used to determine which genus and species the bacteria most closely resembles genetically. This is done by obtaining a pure culture of the bacteria and extracting the DNA. This was done by using the TE Boiling Method, which uses glass beads for Gram-negative bacteria and freeze-thaw cycles to open the cell membranes. Using universal primers that amplify hypervariable regions V3-V4 of 16S rDNA, the DNA was then amplified through polymerase chain reaction (PCR), creating thousands to millions of more copies of a particular DNA segment. These copies were then sent to Functional Biosciences to have their 16S rDNA sequenced. The anticipated outcome of this laboratory is to determine, as best as possible, the genus and species of these bacteria.

**Abstract Code:** P61

**Presenter(s):**

Madeline Lundblad

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** The Evolutionary Roots of Hypoxanthine-Guanine-Xanthine Phosphoribosyltransferase

**Abstract:** Nucleotide metabolism is a way for living cells to replicate DNA that is necessary for normal cell function. To produce this DNA, the cell has two options, either the de novo pathway or the salvage pathway. The de novo pathway functions by creating the nucleotide from simpler molecules over several steps. In contrast, the salvage pathway takes a discarded nucleotide and a molecule of phosphoribosyl pyrophosphate (PRPP) and creates the desired nucleotide along with a pyrophosphate in one single step. In my research, we are looking at a specific enzyme that has been proposed to be involved in the purine salvage pathway, hypoxanthine-guanine-xanthine phosphoribosyltransferase (HGXPRT). To study this, we will use a plasmid to express the HGXPRT gene found in the bacteria *Streptomyces rimosus*. We will be able to purify and subsequently analyze this protein through the use of kinetic assays. Utilizing the Michaelis-Menten kinetics we will be able to measure the enzyme activity. Information gathered from the kinetics portion of our experiment will then be used to compare with other enzymes present in the enzyme superfamily to determine the evolutionary origin of HGXPRT. Studying enzymes like HGXPRT and its family enzymes can lead us to a greater understanding of how the enzymes evolved from their primordial ancestor, leading to a greater understanding of its function.

**Abstract Code:** P62

**Presenter(s):**

Kassidy Steen, Kate Kopeck, William Blong

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Glowing Bacteria

**Abstract:** This study includes many biotechnological techniques, with the ultimate goal of introducing the green fluorescent protein (GFP) gene into Escherichia Coli bacteria and subsequently turning on gene expression. GFP can and has been used in biotechnology to fluorescently tag and track specific cells or proteins over time. Over the course of a semester, we have transformed E. Coli bacteria with the introduction of pGLO plasmid, a circular segment of DNA that is 5371 base pairs long, and pET-28 plasmid, which is 5269 base pairs long. The pGLO plasmid contains a GFP gene, and an ampicillin resistance gene. Contrastingly, the pET-28 plasmid contains kanamycin resistance gene. Initially, the pGLO and pET-28 plasmids were added to chemically competent E. Coli cells separately. Once introduced, polymerase chain reaction (PCR) was run, to allow for amplification of the GFP gene. Following this, the DNA was digested by EcoRI-HF and NheI-HF restriction enzymes to ensure cutting around the GFP gene on the pGLO plasmid and around the insertion point of interest on pET. Gel electrophoresis was run and plasmid DNA was isolated via gel extraction techniques. The plasmid DNA including the GFP gene was then ligated back together. To ensure the ligation was successful, glowing colonies were suggestive of GFP presence. Growth on plates with kanamycin was suggestive of successful pET-28 ligation. The DNA was sequenced for further confirmation that the gene of interest was present. In addition, gel electrophoresis and gel extractions were also indicative of successful GFP insertion at different stages of the study.

**Abstract Code:** P63

**Presenter(s):**

Cassandra Gallentine, Dannyalle Breeden

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** The E. Coli Clone Wars

**Abstract:** The goal of our experiment was to isolate and mutate the green fluorescent protein (GFP) using standard biochemical techniques and procedures. The gene that codes for the green fluorescent protein is gfpUV. This gene was sub cloned from the pGLO plasmid using polymerase chain reaction procedures and inserted into a PET28T Escherichia coli (E. coli) plasmid. The PET28T plasmid is designed for efficient protein synthesis. This allows E. coli to express the GFP gene for further studying and manipulation like mutagenesis. This type of research is important because GFP is widely used in a variety of research, from tagging genes for expression, acting as a biosensor or marker, to studying protein-protein interactions and much more (Patrick, M). There are economical uses for GFP as well, such as incorporating them into the genes of pet fish, otherwise known as GLO fish. As research on this protein improves, so can their use. Additional colors can benefit studies that are sensitive to color, or studies that need additional separate markers to distinguish multiple genes or cell types. Patrick, M. (n.d.). Hbspt.cta.\_relativeUrls=true;hbspt.cta.load(306096, 'e7970e85-a26a-4d97-a762-1d3a530cf4ea', {}); Retrieved from <https://blog.addgene.org/plasmids-101-green-fluorescent-protein-gfp>



**Abstract Code:** P64

**Presenter(s):**

Nihmotullahi Adesalu, Sophia Su

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Ready, Set, Clone : Recombinant DNA Technology as told by Escherichia coli

**Abstract:** For this experiment, plasmid DNA strands “ pGLO and pET28 were inserted into Escherichia coli (E. coli), a bacterium that is widely used in research, and a series of analytical procedures were ran in order to verify protein expression. This research stems from the need to gain further insight to a recent area of scientific research; recombinant DNA technology. This is an area of science which has had a great impact in the genetics of not just the medical field as seen in the mass production of insulin but also in agriculture for the generation of herbicide and insect resistant crops. The primary goal of this experiment is to take isolated plasmid DNA sequences from other organisms and then physically insert them into another biological organism, in this case E. coli, hence the recombinant nature of this experiment, to achieve protein expression. Laboratory techniques such as media preparation, polymerase chain reactions, enzyme digestion, transformation, ligation, etc. are utilized. The educational component of this project is completed within three months; thirty hours of research and hands-on laboratory techniques were required.

**Abstract Code:** P65

**Presenter(s):**

Nicole Ringle, Emily Bettinger

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Transformation and Expression of Green Fluorescent Protein in Escherichia coli

**Abstract:** Green fluorescent protein (GFP) is naturally found in the jellyfish species *Aequorea victoria*. The expression of this protein results in bioluminescence. The GFP gene is easily detectable as its expression is visible to the naked eye. Since its isolation by scientists, the gene that encodes for GFP has been widely used in biotechnology. In particular, fusing genes of interest with the GFP gene has allowed scientists to visualize the movement of cellular proteins. In this project, the plasmid pGLO containing the GFP gene was transformed into *Escherichia coli*. Techniques were employed to ensure that the GFP gene was actually present in the plasmid. *E. coli* was chosen as the model organism because it is extensively studied and easy to work with. Gaining the ability to work with and manipulate DNA is an important and applicable skill in the field of biotechnology. Introducing and expressing genes in bacteria is used in disease research, vaccine creation, and biofuel creation. This technology is used to produce insulin and diagnose HIV. Due to the vast expansion of the field of biotechnology, the skills learned in this project go beyond GFP. The same technology can be used to study other genes and proteins of interest.

**Abstract Code:** P66

**Presenter(s):**

Rostand Kom, Josie Hyndman

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Subcloning of the GFP Gene in a Plasmid DNA from pGLO to pET

**Abstract:** The presentation is about a series experiment done in class throughout the semester, which consisted of learning how to transform the DNA from a bacterium and to clone it, for the purpose of the study of a gene. These experiments are important as they constitute the base of many of the greatest medical and pharmaceutical research in the study of bacteria, the development of antibacterial drugs and the study of genetic diseases. Often, when people think of bacteria, they only see them as harmful, but in truth, this is not the case. Most of the bacteria known so far are not harmful and These experiments highlight the fact that they can be helpful. The purpose of this project is to cultivate people, to lure them toward the world of biochemistry and help them understand how much can be accomplished by using a tiny living being such as a bacterium. The presentation for this project will take from 40 min to about an hour and will be addressed to any type of audience. As an outcome for the project, we are expecting the audience to leave with a better idea of what bacteria are, what they can do and what they can be used for. Also, we will want the audience to have developed a higher enthusiasm toward the field of biochemistry by the end of the project presentation.

**Abstract Code:** P67

**Presenter(s):**

James Nibbe, Glapougbae Garmondeh

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** What is GFP? A Study into the Cloning of GFP in pGLO

**Abstract:** In today's scientific community, green fluorescent protein (GFP) is widely used to tag various proteins and to study the dynamic changes of cellular processes in many living cells. GFP is a small protein consisting of 238 amino acid residues that absorbs blue light and emits green light in response in a process called fluorescence which does not require any additional substrates to produce green visible light. In nature, GFP (also known as aequorin) exists as a protein in the jellyfish species, *Aequorea victoria*, giving the jellyfish their unique ability to fluoresce. In the lab, GFP can be used for tagging various genes for elucidating their expression, acting as a biosensor or cell marker, studying protein-protein interactions, visualizing promoter activity, and much more. During the course of this project, GFP from the bio-engineered plasmid pGLO was integrated into a colony of *Escherichia coli* bacterial cells giving the cells the ability to fluoresce when placed under a UV lamp. Employing various subsequent laboratory techniques, the gene encoding GFP was purified from the fluorescing bacterial colonies and introduced into a new parent plasmid. Overall, this project will summarize the steps needed to clone variants of the pGLO plasmid and the significance of such laboratory protocols.

**Abstract Code:** P68

**Presenter(s):**

Adonijah Nyamasege, Patrick Nyamasege

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Subcloning of the GFP gene from pGLO to pET

**Abstract:** Bacterial transformation and cloning are a paramount hallmark in molecular biology. Genetic transformation occurs when a cell takes up (takes inside) and expresses a new piece of genetic material (DNA). This new genetic information often provides the organism with a new trait which is identifiable after transformation or cloning. In the experiment, recombinant plasmid DNA (GFP) contained in PGLO was cloned to PET using various process. This cloning was done using the pGLO plasmid. Under proper conditions, a cell incubated with plasmid DNA PGLO, takes up the plasmid DNA into its cytoplasm. The PGLO Plasmid contains the following, a gene for GFP, a gene for antibiotic resistance and regulation of the GFP gene. Previous studies have introduced the idea of using Fluorescence Activated Cell Sorting (FACS), to detect and isolate transformed cells immediately after transformation with a plasmid bearing a gene coding for green fluorescence protein (GFP).<sup>1</sup> Bennet et al. used GFP containing pGLO transformed into BL21 E. coli cells to visualize GFP expression through fluorescence microscopy and flow cytometry 1 hour following transformation.<sup>1</sup> For this experiment, however, the introduced gene was isolated and detected through a series of subsequent steps. These steps included polymerase chain reaction, miniprep, digestion, gel electrophoresis, and gel extraction. It is expected that the GFP gene should be present in the subcloned PET. The Green fluorescent protein will be detected under ultra-violet light, indicating cloning has taken place.

**Abstract Code:** P69

**Presenter(s):**

Eric Peters

**Faculty Mentor(s):**

Christina Cama

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Synthetization and Characterization of  $\text{CuFe}_2(\text{P}_2\text{O}_7)_2$  for Use in Batteries

**Abstract:** In common day batteries, the lithium ion battery is the most widely used. This battery consists of a graphite anode with a lithium metal complex as the cathode, where when charged the lithium intercalates into the cathode layers. Copper iron pyrophosphate ( $\text{CuFe}_2(\text{P}_2\text{O}_7)_2$ ) has unique advantages in the use of lithium ion batteries as a replacement for the commonly used graphite electrodes. Copper iron pyrophosphate promises higher energy storage capability. In batteries, energy is stored through the transfer of ions and electrons. This property is defined as the capacity, mAh g<sup>-1</sup>. Graphite has an accepted value of 350 mAh g<sup>-1</sup> and copper iron pyrophosphate has a theoretical capacity of 567.62 mAh g<sup>-1</sup>. The increase of capacity shows that  $\text{CuFe}_2(\text{P}_2\text{O}_7)_2$  promises a greater storage capacity than graphite materials. Additionally, this material promises an increase in electronic conductivity during battery operation. This presentation summarizes efforts to synthesize pure-phase  $\text{CuFe}_2(\text{P}_2\text{O}_7)_2$ . The synthesis of copper iron pyrophosphate involves a co-precipitation reaction between ammonium phosphate dibasic solution, copper nitrate and iron nitrate solutions. Following precipitation, the precipitate is heated under various conditions to crystallize samples and obtain phase purity. Sample compositions were identified using X-ray diffraction.

**Abstract Code:** P70

**Presenter(s):**

Charlie Tran, Sushil Khadka, Cheng Xiong

**Faculty Mentor(s):**

Mehdi Mekni

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Smart Irrigation Using IoT

**Abstract:** In today's time, technology and automation devices are used for human convenient and better result. Smart irrigation system monitors indoor plant while people are far from home. This paper focus on a smart irrigation system which can be controlled via mobile app. The app can act automatically if no command received from user. The objective of this paper were to develop an intelligent home irrigation system that collects soil moisture readings from in-ground sensors and analyzes the data to determine the necessary amount of water needed for the user's plant. The purpose of this product is to make home irrigation systems easier and smarter by providing customers with an automated watering solution that helps with water conservation and provides remote access through an easy to use mobile app. Smart irrigation system is designed to take advantage of soil moisture sensors to provide a smart watering system for users. All watering activities will be governed by a smart controller which will be able to collect information about current soil moisture levels and allow the user to adjust watering amounts and times based on those readings. User can monitor moisture level in soil via mobile app and water the plants remotely or system acts automatic if no command received from user.

**Abstract Code:** P71

**Presenter(s):**

Jordan Kleinschmidt

**Faculty Mentor(s):**

John Sinko

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** CNC Wood Engraving Table

**Abstract:** Computer numerical control machines, or CNC's for short, are some of the most utilized manufacturing processes today and can be found in anything from lathes and mills to 3D printers. CNC machines integrate a wide array of technologies, including mechanical motors, circuitry, sensors, and computer programming to create goods precisely and quickly. A CNC laser engraving table allows wooden workpieces to be engraved and/or cut to create artful works efficiently and precisely. The table utilizes biaxial motion to maneuver the focused beam onto a specified point. A custom image is uploaded into a software program that translates its markings to a computer controller using a special language to speak to the motors, telling them exactly how far to go in each direction simultaneously. The laser system used is a high-power Class 4 carbon dioxide laser and emits dangerous radiation, therefore an enclosure is necessary to avoid direct contact with the beam and to evacuate any fumes that the laser or the workpiece may emit. The project is intended to be easy to emulate and cost-effective for those who may wish to realize a similar concept and explore the world of applied sciences and artistic endeavors.



**Abstract Code:** P72

**Presenter(s):**

Cassidy Lehrke

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Violence and the Prefrontal Cortex

**Abstract:** The research taking place concerns the development of the prefrontal cortex and how different events in its development can increase or decrease one's susceptibility to violence. It is known that the prefrontal cortex's development is one of the most crucial aspects of human development as what happens during these stages can permanently alter the brain. With further research, it can be concluded how and which certain events one faces during development will alter our brain development and how that can create or deter violent tendencies. Violence is a concern in today's society and has been linked to many different sources, such as video games, social media, and movies. With grand scale tragedies such as mass murder, shootings, crimes, and genocide, it is becoming ever so necessary to find the root of violent tendencies and diffuse them at its source. The goal is to further understand how and where violent actions stem from and how society can be mindful and proactive in an attempt to restore a peaceful planet.

**Abstract Code:** P73

**Presenter(s):**

Amy Stanfor

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Race-Conscious Admissions in Higher Education

**Abstract:** This research paper will examine the effect that race-conscious admissions has on academic performance in higher education. Many major universities are currently using race as a factor in determining who is accepted into their university. This is largely due to Affirmative Action laws in the US. This paper will discuss how Affirmative Action and race-conscious admissions work and what affect this has had on racial groups. This paper will also discuss how these methods affect student academic performances. This will include retention rates, dropout rates, grade point averages, and graduation rates specifically in minority groups. These factors will all be examined to determine the effectiveness of race conscious admissions. This data will be gathered using studies done at numerous major universities where race is taken into consideration during the admissions process and well as schools that practice race-neutral methods. For example, I will be using studies from Harvard University, University of Texas at Austin, and the University of Georgia. These results will be compared to determine if race-conscious admissions are truly helping minority students to succeed or if these students are actually being harmed by these methods.

**Abstract Code:** P74

**Presenter(s):**

Reece Meskimen

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Liberal Education Courses for Specialized Majors

**Abstract:** It is important to understand how students can most benefit from learning. By researching liberal education courses and their effect on students, more effective curriculum may be applied by the facility to assist in a student's learning. College attendees are required to take many classes and can cost them plenty of time and they may acquire debt. Only by understanding how liberal education courses effect students in specialized majors we will be able to determine if these classes are beneficial for the student's academic career. The research that goes into how these classes can effect students will dive into a student's cognitive ability, their outlook, and their life after school.

**Abstract Code:** P75

**Presenter(s):**

Brandon Meyer

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** How Do Biological and Environmental Factors Cause Some People To Be Resilient to Depression?

**Abstract:** Most would agree that surgery is a good way to repair damage done by a heart attack. Even more would say that taking measures such as proper and diet exercise to prevent that same heart attack would have been the best solution for that individual. That analogy has led me to one question: How do biological and environmental factors cause some people to become more resilient to depression than others? Counseling, counseling, and therapy are a wonderful solution for people who currently battle depression, but it would be even better if we could prevent that depression from happening in the first place. Many of us know someone who seemingly has overcome all the odds to accomplish extraordinary things, but how did that person get there? Early childhood trauma shows high correlation to depression later in life, yet some individuals make it through those situations relatively unharmed. In this paper I will attempt to explain the roles of serotonin, neurotransmitters, and nerve cells in the hippocampus and how they function differently in depressed and non-depressed individuals. I will also look at the role's environmental factors such as social support, drug and alcohol abuse, stress, and traumatic events play in the lives of depressed individuals. With this information, I will be able to give a comprehensive analysis on just why some people become depressed while others do not.

**Abstract Code:** P76

**Presenter(s):**

Elizabeth Pechovnik

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Women in STEM

**Abstract:** Science, Technology, Engineering, and Math (STEM) has changed the world in so many ways. It has allowed people to make their lives more efficient in all categories. STEM has been significantly dominated by men, but women also have passions to change the world with these fields. They unfortunately, in the past, have been and are limited to fields including nursing, social services, education, and a few others because of stereotypes and gender roles. Women are working to cease the stereotypes and gender roles for good by coming together on the issue to solve it. Some great examples of this include organizations like Women who STEM, Society of Women Engineers, Tech Savvy, and more which spreads the encouragement to women who have, are, or will be a part of STEM

**Abstract Code:** P77

**Presenter(s):**

Joshua Killmer

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Analyzation of the Reasonings For/Against The Indian Removal Act of 1830

**Abstract:** The Indian Removal Act of 1830 drastically changed the United States' history forever. Taking the southwestern Native American tribes and moving them West through what became known as The Trail of Tears and onto the reservations that we still see today. But with almost all political legislation. There are two sides, one for it, and one against it. Using philosophical methods of argument analyzation, both sides of this debate will be looked at to see why many wanted to pass such a horrific act and why many did not want this act to be passed. This analyzation will focus on the main supporters on both sides of the argument as well as specific ideas in their statements that lead them to think the way that they did. Examples of historical figures that will be analyzed are seventh President Andrew Jackson, Cherokee leader John Ross, Senator Theodore Frelinghuysen, and Methodist minister William Apess. Along with the analyzation of the argument, there will also be alternative methods that were brought up that could have been better than the horrendous forced removal of the Creek, Seminole, Cherokee, Choctaw, and Chickasaw tribes. Indian removal was an event that happened so long ago that many people in the United States today know that it happened but don't know why or how it happened.

**Abstract Code:** P78

**Presenter(s):**

Teagan Dvorak

**Faculty Mentor(s):**

Cindy Gruwell

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** How Natural Hazards Affect the Tourism Industry

**Abstract:** How Natural Hazards Affect the Tourism Industry  
Abstract Tourism is an extremely large industry across the globe. Many aspects impact the industry, one being natural hazards. They can play a role in the economy of popular tourist destinations. Specifically, coastal regions are largely impacted by natural disasters, such as hurricanes and tsunamis. Many tourism companies choose to establish their businesses in coastal areas. In turn, there is a great chance that they will be affected with some form of natural hazard at some point. These disasters can negatively affect the economy in these places and put tourists in danger if they are not informed of the potential threat of the hazards. Through research, I will identify the most threatening natural hazards along with the most substantial impacts on the tourism industry. Natural hazards leave a negative impact on the tourism industry and will continue to affect it in the future.

**Abstract Code:** P79

**Presenter(s):**

Rebecca Campbell

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Economic Effects After the September 11th Terrorist Attacks

**Abstract:** This paper explores how the terrorist attacks on September 11th, 2001 affected the economy in the United States of America. The September attacks were a dark and confusing time for some people, those who lost loved ones and those close to the attack. While causing much confusion and chaos the attacks also caused many problems economically for the United States. Specifically the unemployment rate, consumer behavior, and the increase in security. This research found that the unemployment rate had drastically changed shortly after the attacks, specifically in New York. The consumer behavior for many consumers, both near New York and Washington D. C. as well as across the country. Also the increase in security in airports, as well as on planes, affected the government as well as air travel corporations economically. Luckily over time these economic problems have been fixed or evened out naturally, and have given economists an idea of what to do if something similar ever happened again.



**Abstract Code:** P80

**Presenter(s):**

Lucas Goodried

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Biological Effects of Methylphenidate

**Abstract:** The aim of this study is to discover how the administration of methylphenidate to treat ADHD affects the human body. The main focus is to differentiate between the desired and undesired effects of the drug methylphenidate on the body of a patient with ADHD and discern if administration of the medication offers desired effects that exceed the undesired effects. What changes occur in the brain that assist in retaining attention on a task or subject? Does treatment through medication bring a patient's attention within comparable capacity to a subject without ADHD? These are the questions that must be answered through further research and analysis. Another aspect that must be further researched is the possible side effects found to be caused by the administration of methylphenidate. What biological systems are affected by methylphenidate that do not contribute to an increased capacity of attention? The paper will be formatted by these guidelines. The main topics of desired and undesired effects of methylphenidate will be separated into sections with individual research on each topic. If the topic needs to be further reworked to narrow or broaden its focus, then these topics may be expanded upon or completely altered to better fit the research topic at hand. With this as an outline for the research topic provided, a research paper will be created that fits all of the criteria given by the instructor.

**Abstract Code:** P81

**Presenter(s):**

Kassidy Lange

**Faculty Mentor(s):**

Cindy Gruwell

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Impacts of Ocean Acidification on Marine Life of The Great Barrier Reef

**Abstract:** Oceans and large bodies of water occupy a majority of the Earth's surface. With this in consideration, it is imperative to acknowledge the detrimental impacts that global warming is having on such a large percentage of Earth's living things. It is commonly understood that global warming is occurring in direct correlation to human activities polluting the atmosphere. One of the largest pollutants is carbon dioxide, or CO<sub>2</sub>. Oceans are absorbing a considerable amount of the CO<sub>2</sub> emitted into the atmosphere, and in turn it is impacting many aspects of life. Ocean acidification is the process in which CO<sub>2</sub> is absorbed by the seawater causing its pH to decrease making it more acidic. The pH of the ocean is significant to note because it impacts many forms of life within it. The Great Barrier Reef off the coast of Australia has been recognized by many researchers as dying due to ocean conditions including the change in pH. Many forms of marine life that utilize calcification are being directly affected due to the amount of carbonate in the ocean. The acidification limits processes that are undergone by many forms of marine life which affects both their fitness and defense mechanisms. These impacts can clearly be seen through evaluating species such as coral, mollusks, and shellfish that inhabit The Great Barrier Reef.

**Abstract Code:** P82

**Presenter(s):**

Allison Naughton

**Faculty Mentor(s):**

Cindy Gruwell

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** European Influence of Gender Roles in Cherokee Society

**Abstract:** As most people today know, gender still very much affects your place in society and the role you play in many aspects of your life. Since it is still a large influence on life today it's important to know where it originated from and how these roles came about. Prior to European arrival, the land that is today the United States was occupied by various groups of Native Americans. One of the largest and most influential tribes during this time was the Cherokee Nation. The Cherokees differed considerably from the European settlers they would encounter later. Their language, lifestyles and culture were quite distinct, especially their gender roles in society. Women played a large role in their communities and often held most positions of power. Their having power played an important role in their lifestyle and traditions. Soon this would all change due to the arrival of Europeans. Early European life looked much different than that of the Cherokees. The Europeans had many different ways of life. One of the biggest differences from the Cherokees was the gender roles in their society. European society was dominated by men, and women had little to no power or influence. This meant the majority of the first settlers were men. Due to the way the Europeans traded and settled it had major impacts on the gender roles in Cherokee society. A couple of changes caused a huge imbalance in power and the roles of the people. Ultimately, the Cherokee people were hurt by these changes and life and gender roles were forever changed.

**Abstract Code:** P83

**Presenter(s):**

Alexander Seymour

**Faculty Mentor(s):**

Jennifer Lamb

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Fluorescence Across the Life History of Mole Salamanders

**Abstract:** Natural fluorescence occurs when light that is absorbed by particular molecules in an organism's tissues is partially emitted, or reflected, back into the environment at a different, longer wavelength (Taboada et al. 2017). Usually, the reflected light is outside of the visual spectrum of humans, but many marine fishes, such as sharks, lizardfishes, and flatfishes, are known to be able to see fluorescence (Sparks et al. 2014). Fluorescence in amphibians has only recently been studied. Some species of tropical tree frogs fluoresce (Family Hylidae) (Taboada et al. 2017), but so far, the only salamander that has been shown to fluoresce is the Eastern Red-backed Salamander (*Plethodon cinereus*) (Munoz 2018). We know from early, unpublished testing in the Lamb Herpetology Lab at St. Cloud State University that several other salamanders are also capable of natural fluorescence, including the Eastern Tiger Salamander (*Ambystoma tigrinum*) and the Blue-spotted Salamander (*Ambystoma laterale*), two species in the mole salamander family (Family Ambystomatidae). Adult *Ambystoma tigrinum* fluoresce emit or return light that is either red (wavelengths of 600 nanometers) or green (wavelengths of 500 – 560 nanometers), and they fluoresce brightly (see Supplementary Figure 1A). Adult *A. laterale* fluoresces but not as brightly. This are the first time these observations have been made because research has rarely been done on amphibian fluorescence. It is currently unknown if larval *A. tigrinum* or *A. laterale* fluoresce, or if the eggs and embryos might also fluoresce. The overall question for the research I am proposing is which life stages fluoresce in the salamander species *Ambystoma tigrinum* and *Ambystoma laterale*? Specifically, I will determine when fluorescence first occurs, which part of the salamander's coloring fluoresces and how much variation is present among individuals.

**Abstract Code:** P84

**Presenter(s):**

Nam Nguyen

**Faculty Mentor(s):**

Satomi Kohno, Heiko Schoenfluss

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Does Exposure of Vitamin B5 Induce Testicular Development in Temperature Sex-Determination of American Alligator?

**Abstract:** Some reptiles exhibiting a temperature-dependent sex determination are vulnerable to climate change, global warming, and environmental contaminants. The American alligator exhibit a temperature-dependent sex determination which ambient temperature determines the sex of embryos, during a brief developmental window called the thermo-sensitive period. During this period, the temperature triggers an initiation of the gene cascade leading to the sex determination and differentiation. Although a nest temperature daily and seasonally fluctuates, the embryonic gonad could accumulate and integrate the temperature signals into their sex determination. Moreover, this thermo-sensitivity could be overridden by the endocrine-active environmental contaminants. However, there is a major gap in the molecular mechanism between the temperature trigger of sex determination and the gene cascade differentiating gonads. In water flea, vitamin-B5 (pantothenic acid) plays a critical role in a day length-dependent sex determination which is non-continuous signals as same as fluctuating temperatures. To understand how the sex determination trigger is converted into functional signals, we hypothesize vitamin-B5 induces a testicular differentiation in conversion of temperature signals in alligator based on gene expression pattern of enzyme synthesizing vitamin-B5 during the thermo-sensitive period. The alligator eggs were exposed to vitamin-B5 during the thermo-sensitive period at a pivotal temperature and sampled just before hatch-out. Tissues are being analyzed histologically to reveal gonadal-sex ratio of the embryos and their morphological characteristics. Gene expression in gonadal tissues will be analyzed. These results will elucidate a novel importance of vitamin-B5 in sex determination and will lead better knowledge and understanding of the molecular mechanism and the evolution in the sex determination system for the conservation of reptiles.

**Abstract Code:** P85

**Presenter(s):**

Bailey Poster

**Faculty Mentor(s):**

Mark Minger

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Students are Misinformed About What Happens to Their Recycling.

**Abstract:** What do St. Cloud State students think about recycling and what do they think happens to their recycling? Recycling is a way to preserve our resources, some people believe it is important and others do not. For those that care about preserving resources and lowering their personal impact on the climate many people believe that recycling is one of the biggest ways they can help. When asked about environmental issues in a 2014 study by Gail Markle, a majority of respondents said “they believed that the responsibility for resolving environmental problems lies with individuals.” If Americans believe that individuals are responsible for solving climate change then how are they going about doing that? When asked in the study, recycling figured prominently in the answers given when participants were asked what they did to help the environment. But how much do we know about recycling? The most recent report published by the Minnesota Pollution Control Agency (2018) gives statistics from 2016 that are relevant to SCSU students. It showed that the overall recycling rate (including: paper, glass, metal, plastic, organics, and problem materials) was 42.4%, down from 43.4% in 2015. The traditional recycling rate (which does not include organics as composting is becoming more popular) went from 33% in 2015 to 31.8% in 2016. This is a decrease of 33,310 tons. However, individuals only account for 1.5% of solid waste and industrial waste is the other 98.5% (U.S. Environmental Protection Agency 2013). I asked students at SCSU a questionnaire about recycling to see if they could identify a few of these key components.

**Abstract Code:** P86

**Presenter(s):**

Devon Bowker

**Faculty Mentor(s):**

Mark Minger

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Spectrum of Attitudes Towards MN Wolf Management from Lethal to Nonlethal

**Abstract:** This survey and associated data represent a joining between issues of science and society. A survey was conducted in the Spring of 2019 to gauge the spectrum of attitudes towards the management of the gray wolf (*Canis lupus*) in the state of Minnesota from lethal to nonlethal along. Demographic information, as well as a rating of care in regards to each question posed, and general knowledge about the state's wolf population were also collected. The survey, collected using a Google Form, was posed to students of St Cloud State University from a variety of majors, categorized into biology related and non-biology affiliated.

**Abstract Code:** P87

**Presenter(s):**

Donna Vang

**Faculty Mentor(s):**

Satomi Kohno

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Timing of a Gonadal Commitment to the Testicular Differentiation Beyond Estrogen-Signal Producing Ovary in the Temperature-Dependent Sex Determination of the American Alligator

**Abstract:** Many reptiles including the American alligator, exhibit the temperature-dependent sex determination (TSD), whose thermo-sensitive period is between developmental stages 21 through 24 in the alligator. Estrogen signal plays a central role in TSD which can be overridden by an estrogen-exposure. It is important to identify a timing of gonadal commitment to either ovary or testis for a better understanding of TSD and estrogen-signals, although it has been assumed to be sensitive to estrogen during a thermo-sensitive period of TSD. Moreover, some environmental contaminants are estrogenic, and their effects on the sex ratio and reproductive health of TSD-species have been concerned. Utilizing eggs of the American alligator, an estrogen sensitivity in TSD was tested at the three developmental stages, 22, 24 and 26. The eggs were exposed to 5 µg/g egg of 17β-estradiol (E2) or vehicle ethanol alone at a male-biased temperature which produced 81% testis. The E2-exposure at the stages 22 and 24 induced more ovary than the control group, whereas it was not identified in a group exposed to E2 at the stage 26. These results indicated that there is a critical commitment in the testicular development between the developmental stage 24 (100% ovary in E2 Exposure) and 26 (39% ovary with E2), when gonadal differentiation are initiated as enlarging medullary cord and cortical germ cells in testis and ovary, respectively. Some individuals at the stage 26 were still plastic enough to become ovary, when they were exposed to E2. A gonadal commitment to testicular development could be later than a known thermo-sensitive period during the stage 21-24. Results generates a hypothesis that testicular structure may be a default form which stays capable of becoming ovary induced by estrogen-signal until later stages beyond the temperature sensitivity in the TSD.



**Abstract Code:** P88

**Presenter(s):**

Celia Mix

**Faculty Mentor(s):**

Kannan Sivaprakasam

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Degradable Poly(silyl ether)s from Renewable Resources

**Abstract:** Petroleum-based polymers are nonrenewable and resistant to degradation. Degradable polymers, such as poly(silyl ether)s (PSEs), are a favorable alternative to polymers derived from fossil fuels. PSEs degrade into environmentally compatible products and may also be synthesized from biomass-based monomers. Step-wise polymerization reactions of various hydrosilanes and 1,4-bis(3-hydroxypropyl)benzene (BHPB) are catalyzed by a manganese salen nitrido complex. BHPB is a petroleum-based monomer and future work will include studying clove oil-derived alternatives. Thermal stability data of three types of synthesized PSEs was collected by  $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR, differential scanning calorimetry, thermogravimetric analysis, and gel permeation chromatography. Results indicate that PSEs developed from renewable feedstocks have many applications, including drug delivery. I will be presenting a poster of my findings in this research project that I performed at the University of North Dakota. The National Science Foundation funded this work through a Research Experience for Undergraduates (REU) grant to be used toward chemistry and chemical engineering research. I applied the ideas and techniques I learned during this REU to the benefit of my courses at St. Cloud State University. These findings will also be presented in my Senior Thesis class to graduate with a bachelor's in Biochemistry from the Department of Chemistry and Biochemistry.

**Abstract Code:** P89

**Presenter(s):**

Elliot Murzyn, Gavin Sahlstrom

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Why So Green: An Experimental Approach to Escherichia coli Transformation

**Abstract:** We students will be taking Escherichia coli (E. coli) and transforming them with a commonly used plasmid, known as pGLO. pGLO is a widely used and examined plasmid used for the genetic modification of organisms. This is, in part, due to the fact that the plasmid is easily detectable by its trademark reporter gene, green fluorescent protein (GFP) which allows the transformed organisms to glow green under ultraviolet light. This was originally discovered in green fluorescent jellyfish. It is a wonderfully visual representation of molecular technique. The success of pGLO transfer also hinges on the promoter connected to the plasmid which determines when the protein is expressed in accordance with different environments. The successful transformation of E. coli will result in fluorescing colonies which will tell if the transformation of the plasmid was successful. We will be using PCR, miniprep, restriction digests, agarose gel electrophoresis, gel extraction, and ligation to accomplish the goals of the experiment. The overall goal of this experiment is to develop a foundation of knowledge regarding modern molecular biology techniques and to learn alternative ways to present research to the general population, so our gained knowledge can also benefit the student community at large and increase interest of transformation.

**Abstract Code:** P90

**Presenter(s):**

Kelsey Seiler, Olivia Gordon

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Genetic Modification of Escherichia coli XL1 Blue with pGLO plasmid for the expression of green fluorescent protein.

**Abstract:** Escherichia coli is a model organism used for genetic experiments. It is a common, unicellular bacteria found in various places in nature, including the human body. Bacteria such as E. coli have provided a wealth of information to the scientific community about the way cells function. Over the course of the semester, we used a variety of biochemical techniques to genetically modify the E. coli strain XL1 Blue with a pGLO plasmid, which contains the sequence for green fluorescent protein (GFP) as well as the sequence that can confer resistance to ampicillin, a commonly used antibiotic. GFP allows organisms to glow a green color under ultraviolet light. Inserting GFP into an organism of interest, like bacteria, can be beneficial for visualizing certain cellular processes. The knowledge that can be obtained from the expression of GFP in cells may provide deeper insight into molecular biology, perhaps including the cellular conditions that play a role in disease development and progression among other applications. This overall genetic modification was accomplished using techniques such as transformation, polymerase chain reaction (PCR), restriction enzyme digests, gel electrophoresis, and ligations. Furthermore, GFP expression in the bacteria can be altered by site-directed mutagenesis to change fluorescence color if needed.

**Abstract Code:** P91

**Presenter(s):**

Ashley Mack, Alam Avalos Rios

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Subcloning of Green Fluorescent Protein

**Abstract:** Isolation of Green Fluorescent Protein (GFP) proteins in order to subclone and transplant GFP into another plasmid. The technique of subcloning achieves the use of a specific DNA sequence from a source and inserted into a plasmid, the goal being for the production of re-combined DNA using the DNA inserted. Through the utilization of various different techniques. Subcloning is a basic procedure required to move inserts from one vector to another in order to gain the desired functionality for screening in the transformed cells. The pGLO plasmid is an engineered plasmid used in biotechnology as a vector for creating genetically modified organisms; the XL1 Blue specifically is an excellent host strain for routine cloning applications. GFP is a protein found in pGLO that glows with a bright green fluorescence when exposed to ultraviolet light. The goal of this experiment is to isolate the gene encoding GFP from pGLO plasmid in order to subclone it into another through the utilization of various different techniques, including but not limited to: transformation, miniprep, PCR, agarose gel electrophoresis, gel extraction and ligation.

**Abstract Code:** P92

**Presenter(s):**

Tanner Simon

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** GFP Gene Expression in Bacterium E.coli

**Abstract:** This will be a poster presentation of the PFG gene expression that was conducted in the Biochemistry 2 lab. The lab was to demonstrate modification of a bacterium to express a specific gene sequence. The gene of interest was PGLO. This gene was selected because if it was implemented correctly into bacteria it would cause them to fluoresce under ultraviolet light. The experiment continued and demonstrated that the gene sequence can be replicated by growing colonies of bacteria that contained the gene of interest. Growing colonies allowed for the cloning of the gene sequence which is cut by the utilization of enzymes. The DNA fragment of PGLO gene was then isolated by the size of the DNA fragment.

**Abstract Code:** P93

**Presenter(s):**

Abdulahi Ahmed, Blake Wood, Edric An

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Cloning of GFP Plasmid within E.coli

**Abstract:** Purpose: The goal of the experiment is to be able to introduce recombinant plasmid DNA into E. coli and be able to clone the genome using PCR. Expression of DNA can be verified using GFP. The experiment can be broken down into five parts: Transformation, PCR, Miniprep, digestion and electrophoresis. What is GFP (Green fluorescent protein)? It is a protein derived from jellyfish. - allows for recognition of cells expressing of the DNA plasmid of interest. Method of Experimentation: Transformation: This step would essentially be taking a recombinant plasmid DNA and introducing to E. coli, a type of bacteria. It's done by adding the DNA into E. coli and let to incubate to allow the bacteria to absorb the DNA. Once that happens, it should be transferred to a new culture environment to grow. Antibiotic is added in conjunction to the DNA. If there is antibiotic resistance when bacteria grow, it should mean that transformation was successful. PCR: A repetitive laboratory procedure that results in geometric amplification of a specific DNA sequence. Miniprep: Extraction and purification of plasmid DNA from transformed E. coli cells. Digestion: Cutting DNA at particular nucleotides for use in DNA ligation or to screen the plasmid of interest. Electrophoresis: The extracted DNA samples are loaded onto a porous agarose gel and let to run from a negative charge anode to a positively charged cathode. The logic behind this is that DNA is negatively charged so it will run towards the cathode. While traveling, proteins and DNA should separate based on their sizes. The separation would be seen under UV light as the samples would fluoresce. A template called a ladder would also be loaded as a comparative measurement tool to indicate the length of the extracted DNA.

**Abstract Code:** P94

**Presenter(s):**

John Kennedy, Jacob Morreim

**Faculty Mentor(s):**

Nathan Bruender

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Mean Green Glowing Machine

**Abstract:** Highly specialized organisms provide an interest to geneticists and molecular biologists. These specialized organisms typically have genetic adaptations that allow them to thrive where other organisms would otherwise die. The differences range from resistance to antibiotics and harmful chemicals, to the ability to breakdown a substance and utilize a food source that other organisms cannot. Significant interest is given to the process of extracting these beneficial genes and introducing them into organisms of value. For example, techniques have been used to utilize E. Coli for insulin production and also give crops incredible resistance to pesticides which would otherwise demolish them. In this instance, the plasmid pGLO was utilized. pGLO is an engineered plasmid used in biotechnology as a vector for creating genetically modified organisms. This plasmid contains the GFP (green fluorescing protein) gene derived from the jellyfish *Aequorea Victoria* and is the gene of interest in this case. Over the course of ten weeks we utilized this plasmid to grow bacteria which would fluoresce green when exposed to UV light. We accomplished this through several steps including (but not limited to) inserting the DNA into the E. Coli bacteria, growing colonies of this bacteria, and replicating plasmid DNA through a process known as polymerase chain reaction (PCR). Furthermore, a separation method of electrophoresis was used in conjunction with other means that indicated to us that we had precisely isolated the gene that had been transplanted into the bacteria, which we like to call the Mean Green Glowing Machine.

**Abstract Code:** P95

**Presenter(s):**

Megan Stumpf

**Faculty Mentor(s):**

Mili Mathew

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Without Skipping a Beat: Use of Gestures & Speech in Adults with Aphasia

**Abstract:** Human beings are typically multimodal when they speak; they move their hands, head, arms, and whole body during the complex process of communication (Feyereisen & de Lannoy, 1991). However, considerable disagreement exists regarding the role of hand gestures during speech production, and the study of gestures in individuals with brain injuries (e.g. aphasia) might provide us the unique opportunity to understand the relationship between gestures and speech (Raymer et al., 2006). The goal of this research study was to investigate the use of hand gestures (referential and non-referential) in persons with fluent and non-fluent aphasia. There were 6 English-speaking participants (mean age: 64; 4 fluent and 2 non-fluent) with a history of left-hemisphere stroke. The participants were engaged in a story retelling task, and the samples were coded for both speech and gestures. The analysis showed that the frequency and rate of occurrence of non-referential prosodic gestures was high for both groups. These results may shed new light on the intact relationship between the prosodic aspects of gestures and speech in persons with aphasia. This warrants additional exploration of discourse-related functions of gestures. The learning objective of this study will allow the audience the ability to describe and discuss the relationship between hand gestures and spoken output in individuals with aphasia.



**Abstract Code:** P96

**Presenter(s):**

Ellen Boisen

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** House It Going? A Study of Brexit's Effects on Housing

**Abstract:** The advent of Brexit has already impacted the United Kingdom's Northern Ireland, England, Wales, and Scotland with the value of the pound decreasing, the economy slowing, and, in anticipation of the break from the European Union, resources becoming scarce. This is quite prevalent in the housing market. Already an environment desperate for housing stock, the increasing shortage of construction skills will likely grow, international trade restrictions will disable the free movement of goods and costs will rise, and housing associations will not be able to access a number of current EU funds. The following study will be composed of a dynamic perspective as the student follows the housing situation before and after the 29th of March. Points of focus for research: What does this mean for various income levels? Does it discriminate against low income populations? Is that just the natural selection of the market? Will it do the opposite? Even if the value of houses drop from Brexit, will this actually prove beneficial to those with lower incomes? Does this point have any actual validity or is it just shallow conjecture? Will the decrease in free passage between countries affect the influx of migrants that stimulate construction jobs affect housing?

**Abstract Code:** P97

**Presenter(s):**

Nathaniel Akouete

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** National Defense Brexit

**Abstract:** My project will be about Brexit and National Defense/Security. I will be looking for any policies that could or would be affected due to this exit. This is an area that should be looked at closely as this exit could bring conflict to the EU and the UK. I think some are over looking this aspect and focusing on more things that could be saved to another time. It will be hard to gather data about this certain issue. This also could lead to looking at border issues and disputes. It also seems like the UK serves as a bridge to Washington when it come to defense. I could also look at how it affects other parties. This exist could also bring opportunistic folks to act as they might see a window of opportunity. It will be good if I get a first-hand knowledge about the subject that could make some of these policies a little bit clearer. I would also think that this might affect respective parties when it comes to NATO assistance. These are some of my concerns for the moment, but I think things will change as we are on ground. I could also focus of outcomes that people expect from the exit and how that might affect parties since I will be limited by available information at the time.

**Abstract Code:** P98

**Presenter(s):**

Ronan Pritschet

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Potential Impact of Brexit on the Irish Economy

**Abstract:** The theme of my proposed Brexit Class Project will be about the impact of Brexit on the Irish economy and will analyze the potential effects of both a soft and a hard Brexit. This topic will go into how the citizens of both Northern Ireland and the Republic of Ireland would be affected by both types of Brexit, with the assumption that a soft Brexit will be less impactful than a hard Brexit. The Irish economy is currently a knowledge based economy, offering many different types of services from financial to tourism based with a very healthy amount of agriculture as well. However should a hard Brexit come to pass Northern Ireland will be unable to export or import food as freely as they had before, increasing food prices due to tariffs on imported food. This is an issue because despite Ireland's agriculture, they cannot produce all types of food, and so they must import what they lack. I plan on gathering information for this project by studying reports on the Irish economy, as well as attempt to speak with shop owners in Belfast and ask them about how Brexit will affect them and their business. This will give deeper insight into the issue and how it'll affect people on a more personal level. I want to look into this issue and research it as most of my mother's side of the family lives in Ireland and I have a connection to the land and its people.

**Abstract Code:** P99

**Presenter(s):**

Mikhail Zaikovskii

**Faculty Mentor(s):**

Ettien Koffi

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** An Acoustic Phonetic Account of VOT in Russian-Accented English

**Abstract:** Russian is known as a true voice language with pre-voicing of voiced stops and no aspiration. It has been noted in many linguistic studies that the native language plays an important role in second language acquisition. There is a study which shows that people continue using their L1 processing strategies of linguistic information to communicate in their second language. In this research, we are interested in seeing whether or not Russian speakers prevoice voiced and voiceless stops when speaking English.

**Abstract Code:** P100

**Presenter(s):**

Rebecca Gleason

**Faculty Mentor(s):**

Gareth John

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** An Investigation into Plastic Pollution by the Cruise Ship Industry

**Abstract:** An investigation into Plastic Pollution by the Cruise Ship IndustryThe cruise ship industry has been polluting the oceans ever since their inspection. Ocean pollution today is a global issue. However, some regions are more severely affected than others. Although it is nearly impossible to identify how many tons of plastic is floating in the oceans today, non-governmental organizations and the cruise line industry are working together to clean up the pollution. In order to examine this ‘great ocean cleanup’, I utilize data from various cruise lines to document the ways the cruise line industry, along with governmental and non-governmental organizations, have intervened in an attempt to reduce pollution from single-use plastics. In particular, I focus on Royal Caribbean’s ‘Save the Waves’to investigate its benefits and how it highlights from the impact single-use plastics have on the marine environment. Keywords: Environmental sustainability; cruise ship industry; single-use plastic; pollution; Caribbean.

**Abstract Code:** P101

**Presenter(s):**

John Dreas

**Faculty Mentor(s):**

Gareth John

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Impact of Road Construction on Traffic Flow: A Case Study of the Twin Cities Metropolitan Area

**Abstract:** The research topic I chose for Huskies Showcase is on construction traffic. Traffic is something most Americans must deal with daily whether it is to or from work. Minneapolis and St. Paul metro area in Minnesota is no stranger to this as highways can be backed up due to too many cars on the road, car accidents that cause slow down, and construction traffic that feels impossible to avoid especially in the summer when the weather is nice. It is the last point I want to focus on as it is an area of traffic that often seems overlooked in favor of other dimensions of traffic. My research will answer the following questions: In what ways do construction traffic impact congestion and traffic flow? How can I use GIS to show the relationship between construction and traffic? How much does closing a lane or a couple of roads impact traffic? Does the length of the road affect anything? As I will be mainly focusing on highways in cities, my research fits firmly in the field of urban geography; this will also include GIS as I will need to map out the results. The specific area I'm looking at is a section of Interstate 35W in Minneapolis.

**Abstract Code:** P102

**Presenter(s):**

Jonathan Corbin

**Faculty Mentor(s):**

Maureen O'Brien

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Lodgings of Lower Town

**Abstract:** “Deep walkability describes a city that is built in such a way that you can move from one area to another on foot, on bicycle, on transit and have an experience that remains a pleasant one, that you feel you are welcome not just in the neighborhood but moving between neighborhoods.” Alex Steffen. The neighborhood we stand in now, hallowed by the halls of higher education was once residential. The immediate area of “Lower Town” which encompasses St. Cloud State University has shifted dramatically in 150 years since the Normal School opened its doors in the Stearns House in 1869. Research conducted over the previous two semesters has been compiled into interactive maps, allowing the viewer to see how the population of the Normal School transitioned in to the surrounding public areas as buildings were destroyed and erected. Historical documents in particular, the Saint Cloud City registers from the late nineteenth century and Saint Cloud Normal School Annuals were used to cross reference the students and faculty of the period, placing their residences on Google Maps while consulting historical maps (i.e., the Birds Eye 1869 map, and the Curtis Edition). Many of the locations utilized by student and faculty between 1884 and 1900 will be recognizable to the campus community of today. Through this research I hope to promote the spirit of Stewardship of Place, connecting our past to our present.

**Abstract Code:** P103

**Presenter(s):**

Grant Den Herder, Lydia Stiving

**Faculty Mentor(s):**

Trista Olson

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Heat Acclimation Through Passive Heat Stress in Active Individuals

**Abstract:** While traditional methods for stimulating exercise adaptations to heat involve training in a warm climate, sources of passive heat stress have been suggested to trigger similar adaptations without the need to train in a hot environment or decrease exercise intensity during the adaptation period. Sauna bathing immediately following regular endurance training may result in adaptations similar to traditional heat acclimation guidelines. Purpose: The purpose of this study is to investigate whether passive heat stress by sauna bathing stimulates physiological heat adaptations in active individuals. Methods: Participants will be sampled from a mid-sized Midwestern university. The initial pre-test will consist of collecting demographic data, blood plasma volume, and endurance performance. Blood plasma volume will be determined by taking a fingertip blood sample that will be centrifuged to measure hematocrit. Endurance performance will be measured by having participants running on a treadmill at each individual's estimated two-mile pace until they reach fatigue; the pace will be constant for each trial. Time to fatigue will be recorded. As a repeated measures experiment, each participant will serve as a control by spending a week following an endurance training protocol adopted from ASCM guidelines and then complete the first post-test. The intervention period will be one week of the same training program followed immediately by a 30-minute sauna bath after each training session with a final post-test at the end of that week. A series of repeated measures analysis of variance will be utilized to evaluate the effects of sauna intervention on plasma volume and fatigue.



**Abstract Code:** P104

**Presenter(s):**

Isaiah Barlow

**Faculty Mentor(s):**

Lori Ulferts

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Sports Management Internship

**Abstract:** My project will entail an overview of my experience interning with the St. Cloud State Athletic Department as a Sports Marketing Intern. I am under the supervision of Andy Sailer who is the Marketing Director for St. Cloud State Athletics. My experience has given me the opportunity to grow on my critical and creativity thinking, seeking and applying knowledge, and communicating effectively.

**Abstract Code:** P105

**Presenter(s):**

Allison Sinner, Brandon Sevre

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Using 2nd grade STAR Math and Reading Data to predict proficiency on 3rd Grade MCA Math and Reading.

**Abstract:** Like most other Minnesota school districts, St. Cloud area schools (district 742) requires students to take math assessments in grades 1-12 and reading assessments in grades K-12 during the fall, winter, and spring trimesters. These assessments help educators obtain data about their students' knowledge in math and reading subjects and use that data to change and improve their teaching criteria and curriculum that reflects their student's knowledge. MCA tests are Minnesota state-wide tests similar to these STAR assessments that are given in the fall and spring semesters. St. Cloud area schools provided two datasets for each subject, math and reading, and also provided a current cutoff score guideline for STAR assessments. Using the MCA and STAR scores, a logistic regression model was used to achieve St. Cloud area schools' goal of using 2nd grade math and reading STAR scores to predict proficiency on 3rd grade math and reading MCA scores.

**Abstract Code:** P106

**Presenter(s):**

Jared Nordberg, Eldon Komppa

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Predicting Reading Test Scores for 1st and 2nd Grade Students in District 742

**Abstract:** The purpose of this project is to gauge if a student is on track in reading from first to second grade. The two tests being used to assess this are the STAR Early Literacy test and the STAR Reading test. These tests are used to measure students reading comprehension and track achievement and growth. We are using the STAR Early Literacy results from 1st grade and the STAR Reading results from 2nd grade from St. Cloud Area School District 742. We're building models to help predict if a student is on track, if not, extra attention needs to be given to that student. Simple and multiple linear regression models are being used to predict each trimester's 2nd grade STAR Reading test score. Logistic regression models will predict proficiency on the 2nd grade STAR Reading test based on the scores in the 1st grade STAR Early Literacy test. We will be examining the predictability of our models as well as the assumptions made when making each model.

**Abstract Code:** P107

**Presenter(s):**

Curran Hansen, Shuk Ying Leung

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** FAST Scores and MCA Outcomes in the Princeton Public School District

**Abstract:** This research project will use statistical analyses to examine data obtained from the Princeton public school district 477 to determine how well FAST exams given to 2nd graders can predict the outcomes of MCA exams taken in third grade. This data consists of 2nd grade FAST scores in both reading and math, along with MCA scores of the same students in third grade. The FAST exams are administered three times per school year, once in the fall, winter, and spring. The MCA scores for both subjects are on a scale of 301 to 399 for third graders. Scores at 350 or above are considered to meet the expectation that is set for third graders in these subjects. The objective of this project is to investigate the relationship between FAST scores and the MCA outcomes.

**Abstract Code:** P108

**Presenter(s):**

Regina Klages

**Faculty Mentor(s):**

Amanda Hemmesch

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Effects of Childhood Poverty in Adulthood: Results from a Random Sample of Minnesotans

**Abstract:** Childhood socioeconomic status has a lasting impact that carries well into adulthood. Previous research has found that these effects are present across multiple domains of neurological and psychological development to the extent that it impacts later-life psychopathology (Hackman, Farah, & Mean, 2010; Ursache & Noble, 2016). Our goal was to examine the effects of childhood poverty on adulthood mental health diagnosis. Telephone surveys were used to collect data from a sample of 502 adult Minnesotans and (50% women, 92% white, age mean = 51.70 years, SD = 19.10) generated through Random Digit Dialing. Childhood food insecurity was used as a proxy for poverty. Participants were asked if their family worried about whether their food would run out before they got money to buy more, and also self-reported if they had been diagnosed with a mental health condition. Data was weighted on age and gender to better reflect the population of Minnesota. Approximately 9% of participants reported that their families often worried about food security in childhood; 25% of participants self reported a mental health diagnosis. Our data is consistent with data from the state of Minnesotans suggesting that approximately 12% of residents meet the criteria for living in poverty. Chi square analyses revealed that participants who experienced childhood food insecurity we're significantly more likely to report adult mental health conditions than those who did not often worry about food security, chi-square = 4.35,  $p = .04$ . This data suggests that there is a relationship between self-reported childhood poverty and adult mental health. Because the effects of childhood poverty are related to adult mental health, more interventions should be focused on reducing childhood poverty.

**Abstract Code:** P109

**Presenter(s):**

Samuel Austin

**Faculty Mentor(s):**

Cindy Gruwell, Trista Olson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Over Training Athletes

**Abstract:** Fatigue effects everyone at some point in time, whether it is an athlete, a mother, a sick patient, or anyone who overworks their system. Three types of fatigue are mental, physical, and chronic fatigue. Each of the three types of fatigue effects each person differently. Athletes will often become fatigued when they are over trained, which can cause long-term and short-term side effects. Overtraining is working athletes too hard and causing their bodies and systems to fail due to the increased amount of work. Being able to prevent fatigue can be as simple as getting a good breakfast and some good sleep. With repeated fatigue, side effects will become more and more serious, and can cause damage to your body and brain. Damage may include loss of motor and sensory control, as well as high blood pressure and headaches. Fatigue, when not addressed, can cause serious harm to athletes and non-athletes alike. Daily activities and professional performance will be hindered by fatigue and continue to worsen until treated and acknowledged. Fatigue is easily prevented but often time overlooked which causes a majority of the issues.

**Abstract Code:** P110

**Presenter(s):**

Kailey Godfrey

**Faculty Mentor(s):**

Michael Dando, Cindy Gruwell

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Detrimental Effects of Sports Specialization on Young Athletes

**Abstract:** Research has shown that there are many negative effects on young athletes when they specialize in sports early in their life. It is perceived that if kids want to earn a college, athletic scholarship, they have to commit themselves to one sport at a very young age. In most situations, this is not the case. Athletes that specialize in a sport at a young age seem to do more harm than good on their athletic careers. Limiting children to play one sport can negatively affect their health, education and parent's bank account. Excessive focus on a single sport at a young age increases the chances of developing an overuse injury or the athlete becoming burnt out, causes ever-important grades to decrease and proves to be extremely expensive, with little financial payback.

**Abstract Code:** P111

**Presenter(s):**

Alex Klepsa

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Concussions in Sports

**Abstract:** In this project I will accurately represent the effects of concussions on kids and athletes. Also, in my presentation I will touch on the topics on contact sports such as football, hockey, basketball etc. I will also discuss how dangerous those sports can be to the human brain. However, I will present how these injuries can be prevented and or treated with equipment, training, lifting and medical attention. I will touch on the topic of equipment and their impact on the game have created a safer environment for kids and athletes to play. I will bring in different pieces of equipment that I personally own to show the impact that they have on the safety of athletes. One major effect of concussions on the brain is that many suicides are link to CTE and concussions. I will provide different websites and articles with information regarding this and how we can help those in need. Also, I will take into account what pro-athletes and doctors have to say about kids and athletes participating in contact sports and explain how even these dangerous sports can still be played safely because of new rules being introduced into the games. I will also add into my presentation my thoughts on the topic and what I think we should do about concussions and the treatment of them with my own personal experiences.



**Abstract Code:** P112

**Presenter(s):**

Andrew Reed

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Origins of the Internet

**Abstract:** This project will primarily focus upon the very beginnings of the internet, why it was created, and who was responsible for creating the internet. When focusing on the very beginnings of the internet, I will be providing information o some of the first web pages and what their purposes were. For why the internet was created, I will be focusing on the communications aspect of the internet. when discussing who created the internet, I will focus on providing much information about the key groups of people that had began the process of creating the internet.

**Abstract Code:** P113

**Presenter(s):**

Daniel Gebur

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** How Mathematics and Music are Positively Correlated

**Abstract:** In this project, I will describe how the influence of music classes such as band, orchestra, and choir affect math test scores in a positive way, as well as show how listening to classical music is proven to increase study productivity. Music affects the part of the brain that deals with mathematical and critical thinking. In general, music is all about math. Time signatures, pitches, and note values are, in theory, just math. There have been multiple studies showing that children who play instruments are able to solve complex math problems faster than children who aren't involved in music at all. Listening to music, especially classical music, is proven to raise dopamine levels, which makes people feel better while studying. Listening to music provides a sense of security. The reason why classical is chosen among other genres is that it can't distract easily; whereas popular music is more well known and could cause people to pay more attention to the song than their studies. My purpose for showing this correlation is to provide a reason for students to join music classes. Over the past decades, the number of students participating in music classes has declined and continues to decline. Losing music education will affect all families affiliated with the arts, and future musicians will be scarce.

**Abstract Code:** P114

**Presenter(s):**

Katya Kivi

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Treatment of People with Disabilities During the Holocaust and Now

**Abstract:** People with disabilities were labeled incurably ill and that they diminished the “master Race”. Hitler decided that this was a good time to get rid of all of these people. They were considered useless and a threat to the Aryan race being pure and basically not worthy of being alive. This is what started the Nazi’s T-4 or euthanasia program. This program required cooperation from many German doctors who deemed the patients unfit for life. The doctors also supervised the killings of these patients as well. Mostly these individuals were killed by gas chambers made just for this purpose but, Handicapped infants and children were killed by lethal doses or even by starvation. Afterwards their bodies were cremated. Eventually there were public protests against this in 1941 so much that the Nazi’s claimed to end the program but carried on with it secretly throughout the war. The estimate of how many handicapped people that were killed was 200,000 people between 1940-1945. The program started in october of 1939 and doctors were encouraged to neglect handicapped patients so they would die from starvation or diseases. In August of 1941 this program is known to most of Germany and is opposed by public figures leading to Hitler ending these programs in public. The term Euthanasia means good death for a patient who would suffer otherwise. This program was the first Nazi mass murder program before the killing of Jewish people. This project will compare treatment of people with disabilities during the Holocaust to treatment now. As well as what we should be aware of in the treatment to prevent something like that from happening again.

**Abstract Code:** P115

**Presenter(s):**

Zachary Hurd

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The A.I. Dilemma

**Abstract:** As computer technology advances, the advent of the artificial intelligence grows closer. While their usefulness is nearly impossible to argue, the scientific community is still split on their creation. Even at our current stage of development with neural networking there are many questions being asked. One of the big current debates is how automated cars decide who to hit in a scenario where they can't avoid an accident, and these problems will only come up more as computers are forced to make more decisions for themselves. Go even further in the future and Androids and the like are an ever-present trope in our science fiction, but experts can't come to an agreement on if we'd be making synthetic helpers, or the Terminator. If we build something as smart as ourselves, or even smarter, can we control it? Do we have the moral right to control it? In a world of inter-connectivity the possible damage caused by a piece of code that can think could be immense. I'm studying the research of various experts in the field in an attempt to find an answer to the question "Should we click run?".

**Abstract Code:** P116

**Presenter(s):**

Warda Mahmoud

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Technology in the Classroom

**Abstract:** From elementary schooling to doctoral-level education, technology has become an integral part of the learning process in and out of the classroom. Traditional paper-based materials and methods have been left behind, while online tools and other technologies and programs are used to discover, gather, and organize information. Collaboration is encouraged and feedback has become a part of constructing drafts and disseminating discovered information and written material. The aim of this paper is to answer the question, “How does technology affect the teaching and learning in the classroom, and why is it important to enforce technology use into the class?” In my research, I will discuss the pros and cons of technology use in the classroom. I will also focus on the history of technology and when it was first incorporated into classrooms.

**Abstract Code:** P117

**Presenter(s):**

Laurens De Smet

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The First Financial Institution: The Knights Templar.

**Abstract:** A presentation on how the Knights Templar built the first financial institution in the west. This will be an in-depth look on the hierarchy of the order, on how they revolutionized the way money was transferred, and the power the order wielded before being disbanded.

**Abstract Code:** P118

**Presenter(s):**

Surkhel Yousafzai

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Speech Tactics by Presidents

**Abstract:** Speech tactics are very important in public speaking especially in Politics. A big portion of Political success depends on the Political addresses to the Nation. The research includes basic speech tactics by US Presidents and what makes a normal speech a remarkable heart touching address followed by an in-depth analysis on different historical and social events where the Presidents of The United States were able to touch millions of hearts through their words. We would also look at the events where the Presidents miserably failed in convincing the public and were unable to gain the support they were looking for. Lastly the research would also address the issue of false statements and how the current leaders have lost the importance of critical thinking and honesty in their sermons to the public.

**Abstract Code:** P119

**Presenter(s):**

Sydney Wolf

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** False Advertising & Fyre Festival

**Abstract:** I plan on researching Fyre Festival and examining how it failed its patrons through false advertising and through mis-mass communication. I will be combing my classes “Intro to Arts Entrepreneurship” which took a look at how businesses in the entertainment industry should act both legally and ethically, and also the class “Intro to Mass Media Technology” in which I learned ways that advertising and public relations can be very misleading to customers if done poorly. The whole event all came crumbling down when advertisements proved false and the festival had nothing prepared when the patrons came, the festival scammed VIP members of huge amounts of money, and left many disappointed when there was scarce food, clean water, shelter, and ways to get off the island. Connecting these two courses will relate how Fyre Festival didn’t act in an ethical way in their entrepreneurship, and how their mass media advertisements were misleading and ultimately lead to the festivals’ downfall. I will be exploring in-depth how this festival and it’s staff didn’t act like ethical arts entrepreneurs and how their mass communication with the public could’ve solved some of the issues. False advertising ultimately overwhelmed the staff of this event and led to it's eventual and abrupt downfall. I will be examining their mistakes and also suggesting how it should've been done.



**Abstract Code:** P120

**Presenter(s):**

Angelena Moua

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Ideology of Race and Racism in Europe

**Abstract:** Going back in history learning about the ideology of race and how capitalism development changes the view of the race. The main argument is that racism had not survived in the start of history. To point out the significant part of the history is that slavery was justified on social class, culture, religion superiority over the inferior race. There was no racism during ancient time, but there were a lot of oppressive of religious belief which steadies the development of racism until the development of capitalism. To Understand race and racism we have to go back during ancient Greece and Roman time. During that time period, they mainly focused on the status of high class, middle class and poor. The superior Catholic church feared other inferior religious groups, so the Catholic church seeks other races to help them become more superior. In this period the human did not think of themselves being superior, for at the time they were overthinking about their spiritual values. As Capitalism starts to develop so does inequality to other races changes. As European start to move toward America so does the development in racism change as well. The company were having competition with other company and wanted more workers thus creating the slave trade. Therefore, at the start of history mainly attack the idea of superiority and inferior of social status.

**Abstract Code:** P121

**Presenter(s):**

Joseph Mitchell

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** What Faith Can Teach Us About Business

**Abstract:** This paper focuses on the economic systems of the modern era and contrasting them with the wisdom and guidance of religious texts. It will take a look and the history of economic systems before looking at the history and tenants of the various religions. The paper will follow this by looking into the religious texts and finding various pieces of wisdom and business advice given within them. The paper will then compare the religious beliefs and the modern economic systems to see how the differing systems align and how they do not. Note importantly, this is not to be a judgment of any religion or system; however, it does reference texts that the author is not as familiar with and include his interpretations of the messages within the text

**Abstract Code:** P122

**Presenter(s):**

Christina Caballero

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Carnival Cruises and Persuasion Advertising

**Abstract:** I am researching what design aspects in Carnival Cruises' advertising help persuade people to go on their cruises. I am interested in researching this because with my major, Integrated Media/Studio Arts, it is very likely I will be involved in designing or being a part of creating advertisements for companies. I chose Carnival Cruise Lines for my company example because they are one of the more popular cruise industries, so they would be fairly well-known. I feel this is important to be researched and discussed since advertising is everywhere in our world, and I feel the art and design aspects of advertising is rarely discussed. It is especially important for corporations looking to persuade families to spend larger amounts of money on extravagant trips, such as a cruise. As someone who is assigned to design an advertisement for such a case, you will need to be extremely precise and creative to hook people in.

**Abstract Code:** P123

**Presenter(s):**

Michael Shiferaw

**Faculty Mentor(s):**

Steve Anderson

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Implications of Human Genome Engineering in the Future of Human Reproduction

**Abstract:** The advent of new techniques and tools in Biotechnology has progressed so rapidly over the past few years. The ability to manipulate the genetic materials of plants and animals can be done with a relative ease and most of all precision (Ran, F. Ann). Even though the old technologies existed in the past, they couldn't perform at the level we wanted them to perform precise changes to the DNA. Recent news regarding new techniques like CRISPR/Cas9 have already shown the potential for it to be disruptive and change the way we see and experience the world. There are numeral ethical questions that have rarely been addressed or are being discussed. It's no longer a question of if but a question of 'when' we will be able to completely reimagine how babies are born. Just because we have the ability to do something, does it mean that we should? Recently, He Jiankui, a Chinese scientist working out of Southern University of Science and Technology in Shenzhen, China, shocked the world as he came out with a video talking about one of his research endeavors which involved genetically modifying a two babies (Cyranoski, David). This came to a complete surprise to the attendees of the Second International Summit on Human Genome Editing, a conference whose main agenda was to talk about the dire issues, implications of this tools that we have at hand. If individuals have significant likelihood of passing on a genetic condition to an offspring, it is now possible for them to take on different reproductive options available. For people who want to give birth without the assistance to technology, they might give birth to a child that is affected by the genetic condition even though they prefer a healthy child. The need to have a healthy child will push them towards this technology. Slowly, most people would change how we reproduce and let the efficiency and the simplicity of the technology take care of what we once thought the "uncontrolled" and random phenomenon.

**Abstract Code:** P124

**Presenter(s):**

Lauren Kirchberg

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Social Cohesion through Interracial Communications

**Abstract:** Racism in the United States takes many forms, and while no singular solution exists, effective communication between all groups involved is critical. This research will investigate interracial communications as it pertains to racism, and the ability of whites to communicate effectively with minority groups in the United States. Effective communication can create successful businesses, workplaces, institutions, and relationships. However, in a diverse society, communication between various races and ethnicities can be complicated and create economic, educational, and social issues. Homophily, or the tendency of individuals to associate with others similar to themselves, can promote social segregation. This research will address how the communication process influences separation of races in society. In this context, racism is defined as a system of advantages or disadvantages based upon race. In the United States a system of racism benefits white people and handicaps minority groups. Furthermore, relations between races are naturally tense as white people use racism to their advantage. However, improving communication dynamics may reduce the power gap between white people and minority groups and promote social reform. While separation and disparity between different races in the United States is evident, effective interracial communication may help relieve racial tensions and promote social cohesion while building a culture of diverse peoples.

**Abstract Code:** P125

**Presenter(s):**

Kelly Winczewski

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Concentrated Solar Power in America

**Abstract:** This paper will link Calculus and Problem Solving with C++ (an engineering course) to research Solar Power. Due to inconclusive data on Concentrated Solar Power, the research will primarily focus on Concentrated Solar Power. Concentrated Solar Power is when mirrors are used to reflect the sunbeams at a focal point, which will have a pipe with water creating steam to run a turbine that generates power. Photovoltaic Solar Power is when a solar cell is used to directly convert the solar thermal energy into a usable direct current (DC). There are three main players in the solar power industry China, India, and the United States of America. The focus will be on the United States of America because a majority of the research done in the U.S. is in English. The costs of solar power have dramatically decreased in the past decade, but the prices are still too high for the average American citizen.

**Abstract Code:** P126

**Presenter(s):**

Elizabeth Lomnicki

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** U.S. Influence of Latin America

**Abstract:** In 1823, during James Monroe’s seventh annual State of the Union address, the Monroe doctrine was introduced to the world. The Monroe doctrine is a declaration to Europe to forego its colonial grip over Latin America. The United States would free Latin America from European control as it freed itself, but instead of Latin America gaining its independence, it instead just shifted its dependency. Latin America had been ridden of its colonial up bringers only to be manipulated by Big Brother. The United States had the illusion of political protection of Latin America. Through this illusion, the United States economically abused Latin America.

**Abstract Code:** P127

**Presenter(s):**

Zoe Welsh

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Research Being Done to Help Find a Cure for Pediatric Brain Cancer

**Abstract:** We know specific cancer organizations persuade us to donate towards specific research, but finding out what research is done to help find a cure will help inform others of what they are donating towards. Whenever cancer organizations ask for donations, the money will go towards funded research at a university or a hospital. Usually the organizations will ask for donations, have fundraisers or sell merchandise to promote the organization. However, most people do not actually know what that research is. This information will be very beneficial to others that do not know what their money is going towards when funding research. The following question will be answered: “What research is actually being done to find a cure toward pediatric brain cancer?” I will be interviewing Professor Rutledge and Professor Scully to gain some insight from what they think could be researched. In addition, I will be talking to Jason Fangusaro who is a attending physician at Ann & Robert H. Lurie Childrens’ Hospital in Chicago; He is specializing in research for pediatric brain cancer. I will also be interviewing William A. Weiss, MD, who has a PhD from the University of California San Francisco and specializes in research for pediatric brain cancer. The purpose of this paper is to see what research is being done to help find a cure for pediatric brain cancer.



**Abstract Code:** P128

**Presenter(s):**

Gabriella Chapman

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Everyday Life Performance in the Workplace

**Abstract:** Since the times of Aristotle, the art of rhetoric has been used to explain performance theories. Originally, performance was used as a lens to analyze theatrical playwriting. When speaking about performance, theater and drama are what the average person would think of first. However, this project is going to center in on using performance in everyday life, specifically in the workplace. How do we use performance to develop a professional persona in the workplace? To answer this question, one can reference Shakespeare’s quote, “All the worlds a stage.” For a more in-depth answer, many theorists’ perspectives on performance in the workplace will be used. The questions will be answered: “How do we make ourselves appear professional?” “How do we identify what is appropriate to do/speak about in the workplace?” “How does communication affect the workplace? Does your communication affect your persona?” All of these questions have answers that co-depend on each other. The goal is to understand real-life situations through performance, and in turn, apply it to your persona in the workplace. Dr. Tami Spry and Dr. Jen Tuder will be interviewed to assist in the research development of this project. Additionally, the theory of Self-Other-Context will be explained and used as a pedagogy for understanding our own professional persona. Different theories of performance will be explained to better understand the topic as a whole.

**Abstract Code:** P129

**Presenter(s):**

Amber Schuster

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** How Cultural Heritage Tourism Affects Genuine Authenticity

**Abstract:** Tourism has a range of different effects on a region while heritage and cultural tourism has economic, social, cultural, and historical impacts on the European region. Heritage tourism is the travel to places of historical importance and significant locations to certain cultural groups. Cultural tourism is strongly connected to heritage tourism or even an alternate form. It concerned with an area's culture, especially the lifestyles of the people, the history, art, architecture, and religion. The European region is culturally rich and historically packed therefore making it a great area to study. Does heritage tourism help sustain the tourist locations in Europe? What are the positive and negative impacts of this type of tourism? What draws tourists to historical places? My research will explore these questions and determine whether or not this type of tourism is a positive thing.

**Abstract Code:** P130

**Presenter(s):**

Quinn Massey

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Why Does Society Have Such Distrust for Law Enforcement Officer and How Can We Gain Better Relations with Law Enforcement

**Abstract:** In today's day and age many people have a distrust for law enforcement due to more coverage on police brutality. This research paper will look at why society has such a large amount of distrust for law enforcement officers, how that happened and how society as a whole can fix that problem. The research paper will discuss why many minorities and people in low incoming housing have experienced prejudice from police in the past and how that has affected their relationship with police. This paper will also look at how the recent police brutality cases and fatal shootings have affected society's views towards law enforcement. To finish, this Paper will then look at how society and law enforcement can work together to better their relationship.

**Abstract Code:** P131

**Presenter(s):**

Nimo Jama

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Imposter Syndrome in Relation to Students of Color.

**Abstract:** What is imposter syndrome? Imposter syndrome is the persistent inability to believe that one's success is deserved or has been legitimately achieved as a result of one's own efforts or skills. Imposter Syndrome is also known as Imposter Phenomenal. There are five types of imposter syndrome that most of the people that experience deal with, which I will cover in my paper. In my research, I will be talking about how Imposter Syndrome affects women of color in comparison of white women in the United States/America. I am excited to do this research and learn something from it as well.

**Abstract Code:** P132

**Presenter(s):**

Mitchell Rice

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Corporation Scandals in the United States

**Abstract:** Abstract In the American Society when there is money involved people start to act differently. For some reason large corporations get caught up in making money for themselves, rather than being ethical. Knowing why CEO's, and CFO's get caught in the trap of wanting to make money illegally has always been an interesting topic. It is hard to understand why one would do it, but once they do and get caught there are serious repercussions that happen to that company. Eventually that company will get caught, and the reputation will plummet. What has most people confused is why would people not do anything about it when one knows that it is going on. It seems easy to tell someone about this when it is going on, but if there are incentives involved then it is easier for them to take that incentive, and not tell anyone about this. This crime is known as the trickle-down effect. This happens when management is doing something immoral, and it goes down to state, even local level. This has happened in multiple scandals, and for some reason the employees do not see the big picture, but only what management is saying. At some point or another the truth will come out, and these companies will face serious fines, and if it is over a certain amount of money could possibly face jail time. American scandals have been going on for a long time, and for some reason people do not learn from other's mistakes.

**Abstract Code:** P133

**Presenter(s):**

Ellie Petrie

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Breast Kind of Knowledge

**Abstract:** Breast cancer is a disease that has affected lives throughout time and space. Cases of cancer have been suspected as early as 1600 B.C., and have increased exponentially into a global health issue today. Throughout history, theories of breast cancer development debated internal versus external forces. People once believed that breast cancer was a contagious, infectious disease that was caused by incidences like fluid buildup, irritation, trauma, or foreign cells. It was not until the mid to late 20th century that scientists discovered the importance of genetic code, or DNA, in cancer development. This crucial piece of information led scientists to discover that cancer is caused by abnormal mutations in DNA (Suchy, 2012). These abnormal mutations cause cells to grow rapidly, forming masses known as tumors. With continued research over the last two decades, scientists' knowledge about breast cancer development is astounding. Research about breast cancer development and treatment is advancing on so many fronts, because it is now understood that breast cancer is caused by both internal and external factors. Although it is not as common, this specific type of cancer can be expressed by inherited genetic mutations. It is a disease that varies across age and ethnic demographics. Even geography can shape where breast cancer strikes. Scientists need to continue to educate the public about how the individual effects of genetics, demographics, and geographical regions interact with each other in breast cancer development in the United States.

**Abstract Code:** P134

**Presenter(s):**

Caleb Clemen

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Bioethical Implications of Germline Engineering in the United States

**Abstract:** Abstract: The next frontiers of biological science will be dealing with genetically editing organisms, in some cases humans. These frontiers will undoubtedly have both supporters and detractors. Germline editing has been attempted in a few countries notably the United States of America, China, The United Kingdom, and Japan. The organisms in these tests have not developed to maturity for different reasons. Academics around the world argue against ever allowing genetically modified organisms to reproduce as it could cause a major bioethical dilemma. Debates surrounding the ethics of genetically modifying organisms has been a relatively recent development. This ethical dilemma is even more important than before because scientists now are researching ways to genetically modify the reproductive cells of organisms. This new and advanced form of gene editing is called germline editing, which means the genes that are changed in an organism can be inherited by its offspring. This new technique has become a major bioethical dilemma because of the possibility of altering the entire population of humans over time, due to the heritability of these induced genes. Genetic engineering has always been a controversial issue, and different nations reactions towards this new technique will shape how they are perceived bioethically by their citizens and the world as a whole.

**Abstract Code:** P135

**Presenter(s):**

Cole Joyal

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** How Good Communication Affects a Business's Success

**Abstract:** It is becoming increasingly evident that employers are looking for employees with good communication skills. Good communication skills have a big impact on everyone, but especially on businesses and the relationships they have with their customers. What if a product is potentially dangerous? Communicating the eminent danger to the customers will help avoid a lawsuit from the customers. Companies must observe exceptional communication practices when interacting with each other as well. Not to mention the interactions that happen within thousands of companies every day here in the United States. My presentation will offer insight into this communication as well as strategies that companies and businesses can use to make them more successful and increase longevity. In order to do this, I will compile knowledge learned from my accounting class (291) and communication studies 192. My project will also answer the questions listed earlier in this document. Furthermore, we can answer the question of what happens when there is not enough communication or ineffective communication. All these factors influence a business's success or failure. The issue affects owners, customers, employees, management, stockholders, the community, investors and the business itself. Good and effective communication must be present in all forms of business such as meetings, conference calls and public relations.



**Abstract Code:** P136

**Presenter(s):**

Michelle Skroch

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Aviation Communication

**Abstract:** In the early days of aviation, communication between plane and ground was severely limited. During World War I planes used light signals and dropped capsule notes to convey messages to the troops, but this method of communication was riddled with problems. Flashing lights revealed the plane to the enemy and the capsule could fall into the hands of the other side, leading to loss of life and backfired plans. Reform was needed and it came in the form of a radio. Since then communication has evolved to encompass plane to plane communication, plane to ground communication, plane to airport communication, and pilot to crew communication. During peace time, reforms in the aviation world are usually the result of plane crashes that had civilians aboard. The evolution of aviation communication is closely tied to these reforms but is commonly overlooked. The connection between poor communication and accidents regarding civil aviation result in massive reforms that have shaped the face of the airline industry. The effectiveness of these reforms are measured by the number of crashes that ensue in the following years.

**Abstract Code:** P137

**Presenter(s):**

Cami Newb

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Knee Joint and Importance of the Meniscus

**Abstract:** This paper explores the differences in long term damage to femoral articular cartilage in normal alignment compared to valgus alignment of the knee joint after a medial meniscectomy compared to a lateral meniscectomy and how it affects the quality of life. The purpose is to understand the importance of the meniscus in sustaining a healthy knee joint. There is a significant difference between the lateral and medial meniscus. The differences of the menisci helps to understand the outcomes of a meniscectomy on the joint. The alignment of the knee determines where the pressure is put on the femoral articular cartilage after a meniscectomy and is important to focus on when understanding how much damage will be done and where to the cartilage. Damage to femoral articular cartilage affects the joint health and can lead to osteoarthritis and effect the patient's quality of life on different levels of severity.

**Abstract Code:** P138

**Presenter(s):**

Karlie Rie

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Evolution of the Accounting Profession in regard to the Progression of Technology

**Abstract:** Today's world has been shaped by the vast progression of technology. This is especially evident in the business world, where technology has affected almost all facets of corporate America. From the way businesses make their financial statements to the interactions with customers and employees. The Accounting Profession has seen some of the greatest alterations. From the way small businesses keep their books to the use of computer programs to file taxes. In this project I will explain the evolution of the accounting profession in regard to the progression of technology. You will learn how the duties of today's accountant differ from the duties of the accountant in the pre-computer era, and how the profession will continue to evolve.

**Abstract Code:** P139

**Presenter(s):**

Jordan Olson

**Faculty Mentor(s):**

Cindy Gruwell, Geoffrey Tabakin

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Effect That Identity Politics Has Had on Bipartisan Support

**Abstract:** This paper will analyze in depth the current division of America in multiple areas and the consequences of potential future divisions. This is from the period of around 2008 to the present, the current phenomena that has revealed itself recently. These divisions include racial, political, and cultural groups. This paper will analyze why these divisions presented themselves, what can be done to limit any future spread of this antipathy, and potential consequences this could have on American society or maybe even on the global stage if things get too heated within our own borders. Specific topics include identity politics, political polarization, political antipathy, Black Lives Matter and other groups that represent only a certain strata of the population under the pretense of equal rights. Also the annihilation of the middle ground between the two parties in recent years, as well as other issues that have become even more divided like gun control, abortion and freedom of speech. Why did this happen, why in a day of such prosperity we fail to recognize each other as humans, we as a society are acting as a defeated nation, by war or economic collapse, yet there is no reason for this. We are so incredibly divided for no foreseeable reason. I hope I can make sense of this.

**Abstract Code:** P140

**Presenter(s):**

Olivia Travis

**Faculty Mentor(s):**

Cindy Gruwell, Geoffrey Tabakin

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Well-Water: The Hidden Dangers Within

**Abstract:** Water Pollution is any form of contamination found in bodies of water. Nitrates is one of the most common pollutions in well-water. The nitrate is used as fertilizer by farmers. It is a growing issue to rural areas and there is knowledge of this issue occurring, although research has been done and solutions have been proposed, educating the public has not been effective. There are health issues due to the nitrate exposure in well-water towards children. The health issues include blue baby syndrome which is a blood disorder of Methemoglobinemia being unable to circulate oxygen throughout organs. Based on research, treatment options to prevent this health issue include water treatment, ion exchange, distillation, and reverse osmosis. Several individuals would benefit if farmers could find a safer alternative instead of using nitrate.

**Abstract Code:** P142

**Presenter(s):**

Sarah Moden

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** How Does Religion Impact The Way People View The Idea of Being a World Citizen?

**Abstract:** Christianity, Judaism, Hinduism, Buddhism, Islam, and many more religions are surrounding our world on a day to day basis. From birth, we are thrown into the values of these religions for our parents and our communities. How does religion impact the way people view the idea of being a world citizen? How do religions being at peace create a world peace? How do people coming together improve the end goal of being viewed as a world citizen by all? From birth, do we have different notions of people because of the religion in which we are born into? Is religion the only thing that alters our views of others? My research will explore these questions to hopefully find a better understanding to this idea.

**Abstract Code:** P143

**Presenter(s):**

Renata Widelak

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Exploring The Human Epigenome Project

**Abstract:** Although the Human Genome Project became a central focus in biological research and study of genetic material in humans, a new discovery in our genetic makeup is not about what kind of genes we have, but which genes are expressed. Why do some people have different hair color or eye color? Why do some children in a family have a disease while their siblings don't? Why is the condition of polydactyly known as a dominant trait, yet most people have the recessive trait of five fingers? In some extreme cases, one person would receive cancer while their identical twin is clear from it. Why is that? In my research, I will be discussing how the transition of the Human Genome Project has helped scientists and researchers to the interesting findings in a new project known as the Human Epigenome Project.

**Abstract Code:** P144

**Presenter(s):**

Kooper Green

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Importance of Elizabethan Economics

**Abstract:** The purpose behind my research is to find out what strategies were employed under Elizabethan Economics in Great Britain during her rule. While Queen Elizabeth I ruled, Britain started to modernize and made many important economic changes that would impact many of the citizens in the country. Trade and commerce would also change greatly during this time, and the English would become major players in a world driven by trading for the goods you didn't have. Queen Elizabeth I would also introduce new laws to help condense the social class gap, but economically this was very challenging as the middle class seemingly disappeared. The Queen was famous for her ability to provoke change and this period is known as the Golden Age of English History. The Elizabethan Poor Laws provided relief for the sick, elderly, and infant poor. The laws also provided work for those who were able and helped much of the poverty affected population develop a strong middle class in England. My study will focus on the many different aspects of what Queen Elizabeth I did to help Great Britain develop into a wealthy nation, and what economic strategies worked well for the British.



**Abstract Code:** P145

**Presenter(s):**

Anna Panek

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Fake News?

**Abstract:** For my research project this semester and my presentation for the Huskies Showcase I will be researching the public's view of the media. Everyone has their own version of the truth, yet many are heavily influenced by the media present in today's society, especially news media. Two of my classes last semester, Disrupting Privilege and Peace for Our Planet, dug deep into this idea of finding our truth and evaluating it against another people's truth. In order to come to some sort of conclusion, I will focus specifically on news media since the turn of the century, with an emphasis on the role of social media. If data allows, I would like to dig into Trump's War on the Media as well. What I hope to gain out of this project is simple, I hope to figure out how much society trusts the media, specifically news media on social networking platforms. The common saying, "don't trust everything you see on the internet" seems to be more and more believed with children being taught how to interact online from a very young age. However, I still believe that many people are heavily influenced by what they see on social media, especially if it is said by an icon like President Trump. The results of my research will prove or disprove my beliefs stated.

**Abstract Code:** P146

**Presenter(s):**

Sam Fredin

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Nuclear Nightmare: The Causes of the Chernobyl Catastrophe

**Abstract:** A plan to gain the upper hand in a fast-paced battle for global dominance. A deadly combination of seemingly insignificant design flaws and numerous human errors. A disaster that impacted countless people and left many more wondering what really happened on that infamous night. This was Chernobyl, a small Ukrainian town that captured media headlines around the world because of the nuclear accident that occurred there on April 26th, 1986. Radiation clouds were sent into the atmosphere, fires and explosions wreaked havoc, and years of confinement strategies and cleanup efforts have followed. Genetic deformations have been seen widespread in the surrounding areas, and the site is still much too radioactive to spend time at. To fully understand the severity of the situation, one must first analyze the days, weeks, and even years leading up to the event. The causes of the disaster at Chernobyl are important to research because humans need to have knowledge about what went wrong in the past in order to minimize problems in the future. Historians, scientists, and technicians have all studied the events that took place in Chernobyl. Their time and efforts were used to figure out what happened with Reactor 4 and what can be done to prevent such demolition nowadays. Their findings have greatly impacted modern-day nuclear power generators, from their design to their precautions. It is important to learn from the past to preserve a better future.

**Abstract Code:** P147

**Presenter(s):**

Matthew Notch

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Public and Private Corporations and Their Risk of Being Hacked

**Abstract:** Abstract: This paper dives into the key of what is able to be hacked and what is not. To find what exactly is vulnerable and on what scale is it vulnerable. To find the answer to this we will look at security measures put in place by the government and private businesses to provide security. We will look at multiple fields and areas (Quantum Computing, Big Data) to find out exactly how hacking works. The findings of this research portrayed the magnitude of what is able to be hacked, and what is at minimal risk for being hacked. There are safety measures and rebuilding measures to maintain security and to serve as protections if there is a breach. Certain implications do arise from this research on the standpoint of security. This research project dives into the core of what is able to be hacked and what is not. We may be limited by knowledge that is not open to the public on government security questions we may have, however in this research topic we will learn to the best of our resources at hand what is able to be hacked and what is not.

**Abstract Code:** P148

**Presenter(s):**

Amaya Bruner

**Faculty Mentor(s):**

Cindy Gruwell, Catherine Verrilli

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** The Influence of West African Music on Contemporary American Music

**Abstract:** The contemporary music of America today is what one may call mainstream. Rap, hip hop, even country. However, the music of today did not just develop overnight. Its history goes back much further. Some research shows that the history can be traced all the way back to West Africa. There is a correlation that can be seen between the West African culture and the music of today. West African culture was introduced into the United States during the time of slavery. Over the years succeeding slavery new types of music were made, using the new methods and ideas for rhythm, pitch, and improvisation brought from West Africa. In the 20th century jazz, one of the first American made music genres, developed from the black communities in the south who were influenced by their West African ancestors. Different styles of music emerged throughout the 20th century that had influences from jazz. Rap, as we call it today, was one of the styles that came about in the later 20th century. Rap music eventually evolved in to the rap many people know today. The influence of West African culture helped bring ideas of using cross rhythms, syncopated rhythms, and polyphonic ensembles. Using multiple rhythms at once was new to the music of America in the 19th and 20th century but has now become prominent in contemporary music.

**Abstract Code:** P149

**Presenter(s):**

Isabelle Solinsky

**Faculty Mentor(s):**

Cindy Gruwell, Marnie Fischer

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Teaching for Creative Minds

**Abstract:** Education is a part of everyone's lives. Whether it's traditional or otherwise, kids are taught things everyday. The current academic teaching styles in schools are not as effective as creative teaching. Our present-day instructional methods make teachers follow strict rules that limit their teaching styles. There is no space to let teachers use their own ideas or resources to teach their own students. On the other hand, creative teaching encourages more visual learning, projects that relate to the topics being taught, and builds a more connected community within the school. This new education technique will also help prepare students for their future. A lot of the information that kids are taught in schools is forgotten as they grow up. Most of the time students will remember the skills they used to finish their assignments. It is important to cultivate skills like creative thinking within schools.. Kids spend most of their younger years in school so we need to take advantage of their growing minds. That means implementing concepts that will help students' work stand out. There are so many skills and concepts that students aren't being taught early enough in their lives and we need to prepare them for their future.

**Abstract Code:** P150

**Presenter(s):**

Riley Johnson

**Faculty Mentor(s):**

Jennifer Quinlan

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Analysis of the Paris Accord

**Abstract:** Climate Change is a scientifically proven phenomena which has been created by our exponentially growing population. If we as a world don't act on the problem within the next twenty years, our average world temperature will rise by 2°C, causing more global issues than we care to know. Luckily, a large part of our world has come together to work towards reducing carbon dioxide emissions in an agreement called the Paris Accord. The 97 countries involved with the accord are split into four main groups: low income, low-middle income, upper-middle income, and high income. The main purpose of this agreement is to figure out how these individual countries can cut back on carbon emissions and enforce greener habits. This paper will consist of the different viewpoints of a country in each of these main groups, along with our own country's viewpoint of the entire process. As many know, the United States pulled out of the accord, and this paper will give information on why this decision was made and how it will affect our country and even the world. Also, along with the Paris Agreement, this paper will include information about smaller agreements that have happened with smaller amounts of countries.

**Abstract Code:** P151

**Presenter(s):**

Desirae Rasmussen

**Faculty Mentor(s):**

Christina Cama

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Synthesis and Characterization of Hentschelite for use in Batteries

**Abstract:** Batteries consume a vast variety of industries, proving that the need for sufficient and dependable energy storage is essential. Modern day batteries are utilized in many day-to-day activities, and provide energy supply and storage to objects such as cellphones, pace makers, and even electronic cars. The lazulite mineral, Hentschelite ( $\text{CuFe}_2(\text{PO}_4)_2(\text{OH})_2$ ), is a potential anode material for lithium-ion batteries due to its capacity range, promising voltage, and conductivity. For this research, Hentshelite is synthesized through an aqueous precipitation reaction and then calcined to obtain the crystalline material. The crystalline is then characterized through X-ray Diffraction (XRD), Thermogravimetric analysis (TGA), Differential Scanning Calorimetry (DSC), Scanning Electron Microscopy (SEM), and Atomic Force Microscopy (AFM) to determine it's purity. Preliminary electrochemistry tests, such as galvanostatic cycling, will be done to explore the energy storage capability and efficiency of  $\text{CuFe}_2(\text{PO}_4)_2(\text{OH})_2$ , allowing it to then be used within an electrochemical cell as an electrode. This will provide important comparisons to other batteries that are used today, as well as the batteries that may be used in the future.

**Abstract Code:** P152

**Presenter(s):**

Gustavo Valdez Paez

**Faculty Mentor(s):**

Ning Hou

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Exploring the Process of LMX from the Perspective of Attachment Style

**Abstract:** I'm in the developmental psychology course right now, which talks about attachment theory, the respond to different ways their parents treat them by developing distinct and stable attachment styles that are preserved throughout adulthood. Attachment styles serve as a lens through which adults engage with outside environment, particularly in the social interaction domain. Attachment theory has recently begun to attract attention of organizational scholars, due to its rich interpersonal implications. We attempt to (re)introduce attachment theory to the large I/O audience by presenting four empirical studies conducted in different cultures that demonstrate the relevance of attachment theory to many phenomena taking place at the workplace.



**Abstract Code:** P153

**Presenter(s):**

Joseph Brough, Shuk Ying Leung, Matthew Moser, Anna Gutzwiller

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Who is in the Stearns County Jail?

**Abstract:** The analysis of the Stearns County Jail between 2015 - 2018 focused on the demographic distributions of who is within the jail system, their origin in terms of birth location, how many are minor offenders/low level, and the amount of bed space being used. It was found that a quarter of inmates are female and three of fourth are male and about 90% of inmates are black or white. The mean age of male and female are about the same 33.7 years and 32.8 years and the mean age regardless sex is 33.15 years. Low level inmates were found to make up just under half of the inmates of the jail data. The demographics of these individuals were similar to the overall jail, excluding sex, where females made up a slightly larger portion of the ratio for low level inmates than the overall jail. The focus of origin of inmates was also broken down in terms of place of birth. Most inmates were from Minnesota or Illinois. Of the Minnesotans, most were from St. Cloud or the Twin Cities area. The most frequent time in the Stearns County Jail is less than a day, but the number of people in the jail is generally always higher than the amount of bedspace available.

**Abstract Code:** P154

**Presenter(s):**

Oleh Bohoslavets, Steffie Phang, Shrijit Koirala, Carlos Aremeshe

**Faculty Mentor(s):**

Nadeesha Lihinikadu Arachchige

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Comparing Domestic and DWI offenses in Stearns County

**Abstract:** The purpose of this research was to compare and contrast the differences between DWI and Domestic probation. The two different data sources used to conduct this research were Probation Data (2013-2014) and Statewide Supervision System Data (S3) (2015-2017). Some of the things were specifically studied by comparing the frequency of re-incarceration, demographics, time taken to re-incarcerate and case closed reasons. There were ten important variables used to conduct this study. Statistical tests and visualization techniques have been used to report the findings of the data. In addition to that common people from both datasets were found. Their DWI and Domestic offenses, and re-incarceration status have been reported accordingly. The two tests used in this research are t-test, and Fisher's Exact test. The p-values along with their Confidence Intervals have been reported as well. Mainly, graphs have been used to directly compare between the two Probations dataset, and the findings have been reported accordingly. The relevant data-sets were then merged. The merged data set represented DWI and Domestic Assault offenses and the main goal of this study was to look at the frequency of re-incarceration of offenders. We also compared the demographics of DWI and Domestic Assault offenders by looking at their age, race, taking the Stearns County population into consideration based on race and gender. Time taken to re-incarcerate and reasons why some cases were closed for DWI and Domestic assault offenders with an evaluation how probation was a success.

**Abstract Code:** P155

**Presenter(s):**

Emma Arme

**Faculty Mentor(s):**

Michael Gorman

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Childhood Development and the Affects on Public Speaking

**Abstract:** The question guiding my research is, is there a correlation between the way that you were raised and your ability for public speaking as an adult? I know many people who are terrified of public speaking, and others who love talking in front of others. I want to find out why different people feel so strongly about speaking in front of other people. I want to take a look in to the aspect of child development and find a correlation within the communication area.

**Abstract Code:** A1

**Presenter(s):**

Taylor Richards

**Faculty Mentor(s):**

Sheila Moriarty, Deola Johnson

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** The Impact of Food Insecurity on University Students Academic Success

**Abstract:** This is a pilot project being conducted at St. Cloud State University with the purpose of helping to alleviate financial insecurity as well as food insecurity for St. Cloud State University students so that they can succeed to their highest abilities. We are an on campus project being run to help students who are in need of financial assistance. We work together to provide a safe, nurturing, and welcoming environment for students to come and discuss some of issues and problems they might be facing. We work together as team to help serve these students and connect them with the tools and resources that they need in order to succeed. Previous literature and research show a strong inverse relationship between academic achievement and food insecurity. The goal of our project is to help shed light on the prevalence of food insecurity faced by many students at St. Cloud State University and help offer them programs, resources, and tools in order to help them strive to their highest abilities.

**Abstract Code:** A2

**Presenter(s):**

Levi Johnson, Kai Zhou

**Faculty Mentor(s):**

Kathryn Johnson

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Cross-cultural Student Teaching Internship Engagement

**Abstract:** This project was orchestrated by Levi Johnson, a graduate intern for the Confucius Institute (CI) as part of the College Counseling and Student Development program, and Kai Zhou, a visiting scholar at the CI, to strengthen and enhance the experience of 12 student intern teachers from across China. They have been involved at several locations around Minnesota and North Dakota teaching Chinese exploratory language classes, Chinese as a second language, and Chinese immersion programs. The goal of this project was to promote the personal and professional development of the student interns during this year long internship for their masters degree in China. After an initial week-long orientation on campus in August, each student teaching intern embarked to begin their experience at their respective school to start the academic year. To guide them in processing the experience together, we had weekly facilitated discussions using Zoom Media to connect and reflect upon positive aspects, challenges, and goals with their personal and professional time teaching in Minnesota. We had a Mid-October retreat where we gathered together for leadership and team building activities, as well as further processing their experience and how they may apply the knowledge from the retreat into their classroom teaching strategies and interactions with their students. All were encouraged to create weekly blogs to share their critical reflections of teaching and learning within their classrooms. We will be participating in another professional development opportunity with all of them together at Saint Paul College for the Students United Advocacy Conference, to gain more cultural insight into changes in higher education and advocacy for student groups. Through this awareness they have a better understanding to serve their K-12 students who may be facing similar struggles and advocating for their success. We aspire to have this project model replicated at other CI locations around the globe.

**Abstract Code:** A3

**Presenter(s):**

Miranda Lattrez, Avik Mallik, Emily Kinuthia, Jessica Johnson

**Faculty Mentor(s):**

Mehdi Mekni

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Automobile Doctor

**Abstract:** Automobile error detection and fixing mechanical issues is currently very expensive and time consuming. There are times where people run into emergency situations when there are no available mechanics nearby. Our project is to create an application to find automobile owners an easier, more efficient, and economical solutions that they can apply mostly by themselves with their phones through mobile application. By deploying Virtual Reality (VR) headset with marker less Augmented Reality (AR), our enterprise level project will let automobile owners directly visualize the actual location of a problem. This innovative technology will be one of the first ever made to solve this issue. As technology advances in this area and more individuals have access to AR and VR, the opportunity arises for a new user-friendly way for car owners to fix mechanical issues and provide mandatory maintenance without assistance or professional training. Users will also be able to troubleshoot without the assistance of a professional. A professional standard mobile chatbot was also built for this project, it will assist users in diagnosing vehicle issues. Chatbots were created for users to better obtain the information they need and explain concepts in user friendly ways. Almost all people today will face a time where they will need to diagnose and fix an issue with their vehicle, and a chatbot is a natural solution to be easily understood by the general public. This chatbot may open the doors of possible investments by giant automobile repairing companies like Tires Plus, Firestone Complete Auto Care etc.

**Abstract Code:** A4

**Presenter(s):**

Kendahl Chergosky

**Faculty Mentor(s):**

Matthew Julius

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Preferential Consumption of Microplastics Dependent on Algal Epiphyte Coating

**Abstract:** Will larval fish display a preference for consuming microplastics coated with certain kinds of epiphytic algae over others? Due to the rising amount of micro-plastic in our oceans, the need to understand what impacts their presence may have on trophic webs is becoming greater. The goal of this research is to gain an understanding of larval fish preferences, as marine grazers are selective in the particles they ingest based on size and taste. Larval fish exhibit food size preference in direct relation to their mouth size, and the quality of food relates directly to larval survival and larval food choice. Epiphytic colonization of marine plastic particles can change food size, altering the desirability of a particle for ingestion. Further, algal type directly correlates with lipid composition and food quality, which may influence preference based on taste. Experimentation will take place over the course of 4 months between November and February.

**Abstract Code:** A5

**Presenter(s):**

Abshiro Mayow, Fatuma Odawa

**Faculty Mentor(s):**

Oladele Gazal

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Molecular Correlates of Nigella Sativa (Black Seed) Effects on Reproduction in Sprague-Dawley (S-D) Rats

**Abstract:** Herbal medicine is used for both prophylactic and therapeutic purposes globally. Plants such as Nigella sativa (Black seed) with multiple pharmacological properties have been used in folkloric medicine to treat a variety of disorders and diseases. Most studies that focus on the evaluation of herbal products for potential uses in relation to disorders in the reproductive system have usually determined herbal effect supplementation on the level of the hormones produced by the pituitary gland and the gonads. Although reproduction is controlled by the hypothalamic – pituitary – gonadal axis through the sequential syntheses and secretion of Gonadotropin-releasing hormone (GnRH), luteinizing hormone (LH) and follicle-stimulating hormone (FSH) and the gonadal steroid hormones, limited studies have determined the effect of herbal supplementation on the synthesis of the hypothalamic and anterior pituitary hormones and the correlation between the genetic message for the hormone synthesis and their patterns of secretion. In the present study, we will determine the effect of graded levels of Nigella sativa (NS) seed supplementation and acute and chronic intraperitoneal NS aqueous extract (NSE) on the expression of the genes that control reproduction name GnRH, LH $\beta$ , and FSH $\beta$  in male Sprague-Dawley (S-D) rats. Further, this study will determine if there is a correlation between the mRNA for these hormones and their serum levels, in the case of the pituitary gonadotropins. These results will provide for the first time information on herbal extract regulation of reproductive hormone synthesis and the relationship between hormonal synthesis and secretion during herbal supplementation.



**Abstract Code:** A7

**Presenter(s):**

Abby Trebelhorn, Haily Koopmeiners, Hailey Nelson, HannaLee Kingstrom, Hannah Rodness, Emmanuel Akinleye, Adele Lies, Sue Yang, Connor Stark-Haws, Olivia Musser, Sara Jensen, Amber Armstrong, Megan Bartkowski, Megan Stumpf, Molly Johnson, Natalie Soles, Keeley Susienka, Amy Marohl, Laura Serrano, Chloe Knop

**Faculty Mentor(s):**

G.N. Rangamani

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Cognitive Communication Disorders (CSD 605): Service-Learning Project

**Abstract:** Keeping in line with the university's mission, vision and learning commitments of active and applied learning and community engagement, this class provides the students a Service-Learning opportunity to work with aging individuals who may be experiencing communication impairments due to a variety of neurogenic cognitive-communication changes and/or disorders. Service learning will help to meet the needs of community partners to improve the quality of life of individuals in the community, as well as integrate the classroom learning experience with community engagement for successful experiential learning. Specifically, the project will provide high-impact experiential learning opportunities to students, where they will interact with community members and demonstrate knowledge and skills by:1. Examining the communicative and cognitive characteristics in neurogenic disorders such as mild cognitive deficit, dementia, traumatic brain injury, and right hemisphere damage.2. Comparing and contrasting the observed characteristics between the various cognitive-communication disorders, and with those of typical aging.3. Evaluating the effects of cognitive-communicative impairments on the activities of daily living and quality of life of the aging individuals.4. Generating and summarizing relevant assessment and treatment measures, and prevention methods, including public education of the various cognitive and communication disorders in the aging population.

**Abstract Code:** A8

**Presenter(s):**

Anne Chase

**Faculty Mentor(s):**

William Gorcica

**Husky Compact Dimension:** Think Creatively and Critically Creatively and Critically

**Title:** Gather

**Abstract:** Everything that causes students to GATHER leaves an imprint on St. Cloud State University's history. The activities, events, protests, etc are what make this university unique. In my project I aim to gather participants to experience this sense of belonging and to highlight how St. Cloud State University has built a strong and diverse community. It will also highlight events in the city of St. Cloud where St. Cloud State University students played an integral part. Using Arduino technology and ultrasonic sensors three participants will gather together to reveal a historic photograph on screen and hear a piece of St. Cloud State University history associated with the photograph. The three participants will need to move together and rely on each other to activate the piece. They will start from a marker toward the back of the room and as they move closer to the screen more of the photograph will be revealed. Once they all make it to the front, the full photograph will appear. Along with the photograph a related historical piece of audio will play once all three participants are in the correct positions. I have created a mockup and interactive display to showcase how the piece will look and function once completed.

**Abstract Code:** A9

**Presenter(s):**

Jessica Krause, Kathryn Helget, Alexis Odle

**Faculty Mentor(s):**

Rebecca Nelson Crowell

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Pediatric Hearing Loss: A Public Service Announcement

**Abstract:** Hearing loss is a topic that is too often geared towards the older population, but hearing loss can and does occur across the lifespan. Unfortunately, many adults are not aware of the potential dangers to their hearing until it is too late. It is important to educate community members on this topic due to the potential life-long impacts that may hinder the pediatric population and their ability thrive within the hearing society. A child's hearing status largely impacts their ability to learn language and develop more complex cognitive processes, thus early detection and prevention is crucial. With more and more children using personal devices such as cellphones and tablets, they are also given more opportunities to damage their hearing with inappropriate volumes being played through headphones, earbuds, and speakers. Prevention is easy if you are aware of the issue! This will be a demonstration in a video format of a Public Service Announcement illustrating the risks and warning signs of pediatric hearing loss. The goal will be to open the public's eye to this potential danger and offer support in remedying it. By spreading the word about hearing protection, we hope that not only will people consider safer hearing options for their children, but for themselves as well.

**Abstract Code:** A10

**Presenter(s):**

Alexis Odle, Kayla Wuollet, Candace Stangl, Nicole Nierenhausen, Katelyn Koshiol

**Faculty Mentor(s):**

Janet Tilstra

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Impact of Long-Term Stuttering in the Pediatric Population - Community Outreach Brochure for DayCare Providers

**Abstract:** Informational brochure on the aspects and affects of stuttering within the pediatric population. Education of stuttering to DayCare Providers is important to understand, due to the potential long-term effects of stuttering. Brochure will include potential situational changes to best benefit a child's growth, core behaviors of stuttering, risk-factors for continual stuttering, and referral strategies. We will be explaining each of these categories in depth to the childcare providers and information contained on the brochure.

**Abstract Code:** A11

**Presenter(s):**

Alison Dylla, Paying Xiong, Nicole Elfering, Noor Aljabari, Nimo Arte, Shazia Buttar

**Faculty Mentor(s):**

Janet Tilstra

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Stuttering within the Adult Population ages 30-50

**Abstract:** We will be writing about adults in their 30's-50's who stutter. We want people to know what it is like to have a stutter and how they truly feel everyday. We want to create awareness for people of their stutter. For people that do stutter we want to inform them of their options, resources, to decrease their chances of stuttering. It is our civil duty to educate the public about stuttering. We want non stutters to be more aware of what a stutter is. Across all cultures, stuttering is all the same, this is something we want everyone to know. We will provide a brochure of information about stuttering. We will provide resources, best practices and facts for people who stutter. Across all cultures stuttering is all relevant.

**Abstract Code:** A12

**Presenter(s):**

Payton Hollister, Jill Schulz, Erin Groskreutz, Paige Evenson, Megan VanHeel

**Faculty Mentor(s):**

Janet Tilstra

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Educating Daycare Providers About Childhood Stuttering

**Abstract:** In CSD 432 Fluency Disorders, we are learning about the causes and characteristics of stuttering and different interventions techniques. We want to educate daycare providers about childhood stuttering. In order to do this, we will create a brochure about childhood stuttering and present the information to daycare providers. The brochure will include basic information about stuttering, such as the core behaviors of stuttering, intervention techniques to help a child who stutters, and additional resources. Before presenting the brochure, we will assess how much the daycare providers know about childhood stuttering by having them fill out a questionnaire. Our goal is for daycare providers to know the common characteristics to identify if a child has a stutter or normal fluency and to be aware of the resources that are available for children who stutter. We will target daycare providers specifically, because they are around children and may encounter a child who stutters. It is important for daycare providers to know how to help the child who stutters and to know different ways to encourage communication in the classroom.

**Abstract Code:** A13

**Presenter(s):**

Tami Klempke, Sommer Kopff, Payton Hollister, Brooke Bares, Abigail Jungwirth, Madison Eiyneck, Katelyn Koshiol, Jessica Krause, Sabrina Knutson, Anna Melicher, Bailey Buchholz, Kylie Johnson, Annika Juenemann, Sophie Lange, Katelyn Dietrich, Hannah Cosk

**Faculty Mentor(s):**

Theresa Estrem

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Llama Llama Pajama Party: Service Learning to Promote Language & Early Literacy Development

**Abstract:** A big part of a speech-language pathologist's job involves planning and implementing therapy activities to target specific communication goals for children with speech and language disorders. Equally important is prevention of and education about language development and disorders. By participating in a service learning project with United Way, students in CSD 461 Language Disorders design craft activities that promote young children's language and early literacy using one of the Llama Llama children's storybooks. The top 3 crafts are voted on by the class to be developed for the United Way Llama Llama Pajama Party Celebration at the Great River Regional Library, a family event that promotes children's language and early literacy. Students prepare the craft materials ahead of time for approximately 500 children and, on the evening of the event, they provide individual guidance to help the children complete the craft and inform the parents how the craft can be used to promote language and early literacy development while engaging their child(ren) during routine activities of the day. At the Husky Showcase, we will present the books, crafts, and parent information that were developed by the students. Husky Showcase attendees will have the opportunity to make their own craft!

**Abstract Code:** A14

**Presenter(s):**

Haley Hanson, Anna Rydberg, Candace Stangl, Nicole Nierenhausen

**Faculty Mentor(s):**

Rebecca Nelson Crowell

**Husky Compact Dimension:** Communicate Effectively

**Title:** Mental Health and Hearing Loss

**Abstract:** This project will be a minute long public service announcement video about the effects that hearing loss has on mental health. We will demonstrate within the PSA what mental health looks like for a person who has hearing loss.



**Abstract Code:** A15

**Presenter(s):**

Hser Poe

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** The Impact of Brexit on UK Immigration

**Abstract:** Brexit is a short word for Britain withdrawing from European Union. EU is a political and economic union of 28-member states that are located primarily in Europe. Also, EU sets up same trading law around the Europe including UK and making peace with their neighboring countries. Brexit will affect many immigrants who lived in UK, and the free movement policy that allows citizens from member states to live and work freely around EU will also end in UK after Brexit. There was a long negotiation between UK and EU and the Brexit that will happen in March 29, 2019. One of the main goals for Brexit is to change immigration system in UK which they want to restrict the immigration to their country. Under EU law, members of the countries are bound by free movement of the people which mean they will not ask for visa requirement, work permit or immigration restriction on each other citizens. For this research, I had to talk to a few people on what they think about the immigration in their country. Do they think the country should restrict immigration or allow people in for a better life? There will be a lot of change after Brexit happens and EU citizens will no longer be given priority to live and work in Britain after Brexit. I had also made observation in UK and people lifestyle there.

**Abstract Code:** A16

**Presenter(s):**

Joseph White

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Brexit as viewed by British citizens

**Abstract:** The theme of my Brexit-related project will focus on the political side of the issue. Specifically I want to talk to the people of the United Kingdom and see why they voted the way they did back in 2016, or if they voted at all, and what their motivations were, as in job, upbringing, economic status, or social condition, and if that played a role in how they voted. Who I want to talk to is regular people, such as shop workers or students, and what I want to accomplish is to see what they think. I would ask when they decided to vote the way they did (or when they decided to not vote), and what made them make that choice. (campaign promise, person advocating for a certain vote, belief in a better future for Britain, etc.) Finally I would ask how things have gone since that vote, as in how has the talks and developments around Brexit have influenced them, and if they could vote again, how would they vote? It is my hope that my project can shine a light on the average person, and what motivated them to make the choice they made.

**Abstract Code:** A17

**Presenter(s):**

Viktor Schroeder

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Brexit on Location

**Abstract:** The theme of my project is to observe and report on the individuals we encounter and what they have to say about the Brexit situation in the UK. Also, through the use of photos and videos, I will document the encounters of each location and gather information regarding how Brexit will affect each location we visit. Because we will be traveling all over the UK, I expect there to be many viewpoints and different kinds of repercussions that will be the outcome of Brexit. Like how each of us has an opinion on Brexit I suspect every location we stop to analyze will also present its case on how they feel Brexit will affect them geographically, politically, monetarily, and much more. With each passing day, the exigency of Brexit creates a more an enigmatic situation that I will personally be researching and engaging in while in the UK for this Brexit trip.

**Abstract Code:** A18

**Presenter(s):**

Ann Olsen

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Brexit Influence on Literature

**Abstract:** Ann Olsen ECON499 Brexit project plan I would like to study and report on how Brexit, both hard and soft, will affect all aspects of literature in the UK, Scotland, and Northern Ireland. This would include the content of the various types of literature as well as the tone of all literature to include printed materials, electronic articles and some social media. Literature changes in various ways in countries affected by any major event worldwide. Previous examples times of changes would be how literature changed after both world wars, various equal rights movements, and even after more minor conflicts such as the Vietnam War. I plan on talking to individuals at libraries in each of the cities that we visit, when possible. I would also like to collect several different types of newspapers and magazines to compare the tone of various print "reporters". I will also spend time both during our trip to the United Kingdom and upon our return researching how Brexit is discussed and portrayed in books and online with electronic venues. I believe that my main focus and therefore sources of information will be newspapers and magazines both printed and electronic.

**Abstract Code:** A19

**Presenter(s):**

Claire Norlin, Alison Palm, Joel Getzke, Rachel Revier, Abigail Jungwirth, Emily Wolcott, Cheyenne Reece, Latasha Simmons, Diana Krousey, Virsaviya Isaykina, Annika Juenemann, Sophia Lange, Hilary Ijiyode, Madison Eiyneck, James Petravich, Anna Rydberg, Melissa Nierenhausen, Julie Thao, Bishesta Karanjit, Shena Vang

**Faculty Mentor(s):**

G.N. Rangamani

**Husky Compact Dimension:** Engage as a Member of a Diverse and Multicultural World

**Title:** Global Perspectives in Communication Disorders (CSD 230): Service-Learning Project

**Abstract:** Keeping in line with the university's mission, vision and learning commitments of active and applied learning and community engagement, this class provides the students a Service-Learning opportunity to work with aging individuals who may be experiencing communication impairments due to a variety of neurogenic cognitive-communication changes and/or disorders. Service-learning will help to meet the needs of community partners to improve the quality of life of individuals in the community, as well as integrate the classroom learning experience with community engagement for successful experiential learning. Specifically, the project will provide high-impact experiential learning opportunities to students, where they will interact with community members and demonstrate knowledge and skills by: 1. Describing the global differences and similarities among cultures. 2. Identifying and analyzing how cultural elements influence relations among the world's educational and healthcare systems. 3. Discussing global/international educational and healthcare issues that affect services for people with communication disorders. 4. Demonstrating critical thinking, advocacy, and citizenship through volunteer-service.

**Abstract Code:** A20

**Presenter(s):**

Larkin Klaus

**Faculty Mentor(s):**

Jodel Page

**Husky Compact Dimension:** Integrate Existing and Evolving Technologies

**Title:** Voice Banking: What to Know Before You Start and Successful Implementation Models for University Clinics

**Abstract:** The Speech-Language and Hearing Clinic on the St. Cloud State University campus (located in Brown Hall) offers a unique service called Voice Banking in conjunction with the ALS Association of MN/ND/SD. Voice banking allows individuals with degenerative disease, such as ALS, record and preserve aspects of their voice. A client attends individual therapy sessions at the clinic and records their voice through an online program called Model Talker with the assistance of the graduate student clinician. Their voice is synthesized into a computerized voice that can then be downloaded into an Augmentative and Alternative Communication (AAC) device. This synthetic voice allows the individual to keep aspects of their unique voice and part of their identity. The client's synthetic voice sounds more natural and personal than the available computer-generated voices. The client is able to be a more independent communicator when/if they lose the ability to use verbal speech using the AAC device and their recorded synthesized voice. This project was presented at the American Speech-Language and Hearing Convention in Boston MA in November 2018. It was presented with faculty and graduate students with a collaboration of resources and information from St. Cloud State University as well as University of Minnesota Minneapolis and University of Minnesota Duluth in conjunction with their mutually beneficial partnership with the ALS Association to provide voice banking for individuals recently diagnosed with ALS. Presenters strive to continue providing education and information to help open voice banks for more individuals with degenerative diseases have access to this specialized service. The professional presentation reviewed the sequence of steps involved in voice banking, tips for successful banking, and resources for starting voice banking programs at university speech-language and hearing clinics. This project explores the voice banking process from the faculty and student's perspective as well as the point of view of the client who is completing the voice banking process. It is important throughout the whole process to provide counseling and assistance for the client and family members as needed and to be sensitive to the client and their ever-changing communication needs while helping them plan for their future.

**Abstract Code:** A22

**Presenter(s):**

Zachery Dishman

**Faculty Mentor(s):**

Lori Ulferts

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Sports and Recreation Internship

**Abstract:** This is a summary of what I have accomplished this semester in my sports and recreation management field. This will incorporate all the things I have done with the St. Cloud YMCA. This will show all the programs and how I contribute to the Y.

**Abstract Code:** A23

**Presenter(s):**

Benjamin Spartz

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Brexit and Effects on Foreign Direct Investments

**Abstract:** For my Project I will be talking about foreign direct investment (FDI) and economic applications of it on Brexit. Before the trip, I have gotten caught up with the literature about some of the foreseeable implications of FDI changes with Brexit. To conduct my in-person research I would like to talk to investment bankers about the local climate of what their expectations are on the risk levels. As we travel across the countryside I would like to speak with as many local business professionals as possible to get their unique take on Brexit and how it is affecting their thoughts on risk in the market. I would be able to also hopefully visit the financial district in London to see what it is like and be able to talk with some investors as well. The Square Mile or the Canary Wharf district seem to be the two financial hubs in which I would like to visit if possible during free time. I am also interested in talking to financial industry employees on there take on if London will remain the central European Finance hub. I will also be sending an email to the NiGEM software company to see if those interested could see their economic modeling software, as well as talk with some UK economists to get there, takes on Brexit. I am also looking to ask some questions about the car manufacturing plant of which we will be visiting about there takes on how their finances may be affected. We will also be visiting some different places of Governance and I also seek to ask about policy implications that could help with FDI. The bank of England would also be a good place to seek knowledge of monetary policies that could affect FDI. Overall, I will seek to learn more from the business professionals of the UK about there takes on Trade and how Foreign direct investment will be affecting the UK economy. After obtaining all of the first-hand accounts I will prepare a presentation using both literature and UK opinions of FDI and Brexit.



**Abstract Code:** A24

**Presenter(s):**

Hunter Brennan

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Impact of Brexit on Financial Markets and Regulations

**Abstract:** Impact of Brexit on Various Financial Markets One of the largest areas of the financial services market that will be affected is the insurance industry. London has the biggest insurance market and is main hub for the world for commercial insurance underwriters. Brexit has the potential to negatively effect London in the matter that it will not be regulatory compliant with the EU. With the details of Brexit yet to be finalized the insurance companies will lose the ability to conduct business and be forced to withdraw from European markets. When looking at the private funds that are based out of London many of the funds have made multiple plans of action to take depending on which way Brexit occurs. Along with these contingency plans many funds already operate alternative investment funds based in Ireland or other European countries therefore the effect on managed funds is expected to be minimal. Many of the infrastructure regulations that came out of the financial crisis of 2008 were created in Britain. Although these regulations fall under the EU and not Britain it is expected that they will adopt many of these regulations due to mutual benefit between Britain and the EU. As of now with no decisive way to exit, the EU and Britain have both agreed to mutual terms to avoid some of the biggest hiccups in terms of regulations without requiring the vote of the government.

**Abstract Code:** A25

**Presenter(s):**

Ashley Carlson

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Brexit and the United Kingdom's Prison System

**Abstract:** I will be exploring the effects that Brexit will have, and currently has, on the United Kingdom/s prison system. This could be through one of two avenues. First, there has been a concern that businesses have not been able to find employees, particularly in the fields of construction, catering and agriculture. Prison inmates could fill these voids if granted day release and it will provide them with skills and job opportunities needed to successfully transition back into society once granted full release. A risk assessment could be administered to determine if the inmate is eligible for the temporary release. Second, I have read that Brexit may end transfers of EU inmates from Britain. The European Arrest Warrant enables the rapid extradition from one Member State to another if needed for a criminal investigation or to serve a sentence. The implementation of Brexit will also allow for monetary savings and open beds within the prison cells if transfer to the Member States is stopped. The House of Commons Justice Committee released a report titled "Implications of Brexit for the Justice System", which touches on multiple judicial and law enforcement policies and administration. If possible, I will be touring a United Kingdom prison to interview staff members and inquire about the effect that Brexit is having on the prison system, and will be observing the day-to-day activities.

**Abstract Code:** A26

**Presenter(s):**

Nina Johnny

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Exploration of How the NHS is Affected by Brexit

**Abstract:** NHS (National Health Services) was launched in 1948 with the idea that healthcare should be provided to everyone, regardless of their wealth. I want to explore how NHS is affected by Brexit. NHS employs more than 1.5 million people, making it top 5 for the world's largest workforces. I want to focus particularly around Brexit's effect on health care workers and healthcare in the UK. Around 10% of doctors in NHS are from another EU country and thanks to the freedom of movement, patients are able to receive high-quality care. NHS staff is made up of people from many other countries aside from the British. Brexit is the key reason more than a third of EU doctors are considering leaving the UK. In terms of medicine, UK's membership of EU allows them to have access to new medicine and medical devices. The NHS was rated as the best system when it comes to efficiency and effective care. With Brexit in place, it could potentially have a negative impact on NHS. As a result of Brexit, we could potentially see a threat to NHS, financially, staffing issues, lower spending, poorer quality. What I will do in the UK to contribute towards my project is talk to any health care workers in the informatory in Alnwick. Interviewing the health workers at Alnwick on their perspective with Brexit and how they have been or will be affected by Brexit.

**Abstract Code:** A27

**Presenter(s):**

Pawku Hser

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Brexit Effects on Education System

**Abstract:** During my trip to the UK I will learn about how Brexit affects the people who seek for better education. Brexit is a short way of saying the Britain is trying to leave the European Union. I am planning on doing a research on how Brexit will affect education in United Kingdom. If Brexit is happening, then I feel like it will affect education system. Children might have to change school, move to a different place, and the school will lost their funding. Not only that but I also want to figure out how Brexit will affect university enrollment. I believe that it will be harder for international students to go and study abroad in UK, because the security will be harder. I also learned that people who live in rural areas vote to leave because they have poor educational system. However, people who live in urban system vote to stay because they are having better chance of getting higher education. When I'm over there, I will try to talk with professor there and see what their opinion are on Brexit and how it going to affect the education system there if British were to leave the EU. I also found an article that actually talks about how it will impact the UK school funding if they were to leave EU. I will do additional research and come up with interesting ideas to talk about when I come back and do my showcase hopefully.

**Abstract Code:** A28

**Presenter(s):**

Ella Taw

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Effects of Brexit on Community Health

**Abstract:** As a student of Community Health, I am interested in researching ,y project related to the healthcare system, focusing more about the effects of Brexit on community health. Also, specifically, on the implications for the healthcare industry post-Brexit. There is a lot of uncertainty and ambiguity as to what the UK healthcare industry and community health will look like post-Brexit. The uncertainty may cause damage and the concern for the supply of workers and resources that needed for interventions, prevention, and the improvement of the health status of population groups and community. As of how I might collect information on the topic of community health during the visit to the UK, I would talk to the local people and discusses their views on current health services and health protection.

**Abstract Code:** A29

**Presenter(s):**

Danny Decemson

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Effect of Brexit on UK Law Enforcement

**Abstract:** For my project, I did a research on the effect of Brexit on UK law enforcement. I figure out what happened to police system in UK because of Brexit. First of all, no deal Brexit will make Britain less safe, police chief warn MPs. Additionally, no deal means the UK would leave the European Union (EU) immediately on 29 March 2019, and there would be no agreements in place about what their relationship would be like in future. In this case it is important for UK to still cooperate and compromise with the EU because if the loss of shared EU network happens it might even direction to some overseas criminals intentionally moving to the UK to avoid arrest. A no-deal could mean officers will need to get a court warrant before arresting foreign nationals, even those wanted for serious offences. Because of the Brexit situation it will effect UK if they leave the EU. For example, Martin a chief committee says there will be disadvantage of the Interpol system is that its method of issuing so-called "œred notice" alerts does not allow automatic arrest, this means police in the UK are necessary to apply to a magistrate before detaining a foreign suspect. This could take hours or even days to arrest the suspect and it is "œunlikely that you'd find them again unless you are very lucky". This will have "œa massive impact", he said. So the case of no deal is the concern of the safety in the country and it could be harder for police to protect the community. This research was done by interviewed people and go to their communities department to know what they thought on the situation.

**Abstract Code:** A30

**Presenter(s):**

Brittany Pfannenstien

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** The Effects of Brexit on the Law Enforcement

**Abstract:** Over the course of the Study Abroad trip to the United Kingdom and Ireland and throughout the rest of the semester, I plan to make my Brexit-Related Project focus on the law enforcement and how that branch of the government has been affected due to all the changes that have happened. Who will the project be about? Why the men, women, or whomever else protect these countries and enforces the laws. What will the project be about? Why the law enforcement and how much has changed since the decision to leave the European Union. When will this project be focusing on? I intend to focus not only on the past, meaning since the decision to leave the EU, but on the present day and how the future could be affected. Where will the project be focusing on? I will focus the project not only on the United Kingdom, but also on Ireland and the differences between the two law enforcements and legal systems. Why am I focusing on this? As a Criminal Justice Major, this will be very informative and insightful to see the differences not only between the countries, but also to see the differences between those countries and the United States. How will I develop this project? If given the opportunity to meet with law enforcement in these countries, I will do so. Otherwise I will discuss with locals if they have been able to notice differences with the law enforcement and the legal system since Brexit and do some research in libraries to gather more information about the legal system and law enforcement. I look forward to learning more about United Kingdom's and Ireland's legal system and law enforcement and compare/contrast to the United States and the effects and changes since Brexit was decided.

**Abstract Code:** A31

**Presenter(s):**

Ivan Jimenez

**Faculty Mentor(s):**

Richard MacDonald

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Brexit Trade

**Abstract:** The focus of my project will be around Trade and its impact to the UK economy post Brexit. The UK is currently part of the single market, which means that tariff and non-tariff barriers are eliminated on the trade in goods and services between the UK and other EU countries. As part of its membership of the single market, the UK commits to follow a common set of rules set by the EU. The most important trading relationship for the UK post-Brexit, will be that with the EU. In order to order to better understand the impacts of trade I hope to connect first hand with the local population in the cities we will be visiting. Understanding the economic impact which will impact specific cities and people of the UK. I hope to visit local manufacturers, trading hubs and financial districts to understand, feel, see, and interact with the very places which will be affected. There are a few types of Brexit's to consider and each Brexit will have its own impact to each locality. First, a hard Brexit, which is a very limited deal between EU and the UK. This will likely have a moderate impact to the UK economy and trade. A soft Brexit, which there is some deal between EU and the UK which will have a lite economic impact and is the best outcome the UK could have. Finally, a no deal Brexit, which would be likely have worst outcome for the UK and most significant impact to its economy and to trade. While each outcome is not favorable for the UK and its economy some will have better outcomes than the others. It will be a great privilege to visit the UK and see first-hand the people and places impacted by this change.



**Abstract Code:** A32

**Presenter(s):**

Sabrina Knutson, Sommer Kopff, Leah Larson, Michael Rouch

**Faculty Mentor(s):**

Rebecca Nelson Crowell

**Husky Compact Dimension:** Seek and Apply Knowledge

**Title:** Preventing Noise Induced Hearing Loss

**Abstract:** Our group will be presenting on ways that someone can prevent noise induced hearing loss. Noise induced hearing loss is a type of loss that is preventable, and we are going to try to educate our audience about it. We are going to explain what noise induced hearing loss is, what levels are harmful to our ears, and how to recognize noise induced hearing loss.

**Abstract Code:** A33

**Presenter(s):**

Brandon Betancourt, Jack Horter, Heede Anderson

**Faculty Mentor(s):**

Matthew Vorell

**Husky Compact Dimension:** Think Creatively and Critically Creatively and Critically

**Title:** Sweater

**Abstract:** Me and 3 of my partners came up with an idea to make a sweater that where you could put your hands in your sweater pocket and still be able to look at your phone without taking your phone out of your pocket. The reason we made this is because of weather conditions where we live at and it would prevent your hands from getting cold or wet from weather conditions.

**Abstract Code:** D1

**Presenter(s):**

Nicole Ruppe, Staci Nelson

**Faculty Mentor(s):**

Mark Petzold

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Weldment Verification

**Abstract:** We are creating a smart tape measure for weldment verification. Park Industries currently uses manual tape measures to measure the position of various parts welded to a metal fixture. Because of human error, the parts are often measured inaccurately, causing the parts to be welded incorrectly onto a fixture. This causes the entire fixture to be ruined and it is thrown away wasting both time and materials. The "smart" tape measure will help to eliminate this waste by providing a clear visual as to the location of where the parts need to be welded. This "smart" tape measure will receive a part number as an input and will search a computer database for the corresponding part. Once the part is either input from the computer or hand-held tape measure, the system will build a queue of all others parts input in the correct assembly order. Once all parts are input, the computer will search the database for a corresponding blue print to verify it is correct, and then will show the user the correct orientation and placement of the end hook of the tape measure for accurate measurement. This will communicate with LED's in the tape measure that light up telling the welder the correct location to weld. This will cut down on time and waste.

**Abstract Code:** D2

**Presenter(s):**

Peter Choudek, Michael Larson

**Faculty Mentor(s):**

Timothy Vogt

**Husky Compact Dimension:** Think Creatively and Critically

**Title:** Smart Oven

**Abstract:** Many different appliances today are used to heat, cook, and bake food. Many of these appliances must be set for both temperature and time. This becomes an issue and safety hazard for the youth, elderly, and inexperienced users. For our project we propose the design of a smart oven that will cook specific food, for a specific time, through an intuitive user interface. This oven will have a touch screen with different options to control the heating. Additionally this appliance will be able to communicate through wifi with Alexa, Google, and other voice control devices. There will be a pizza option, bread option, brownies option, etc. It will also be able to control temperature and cooking time. There are a lot of dependencies in our project so we have to look carefully at how we will choose our parts. We have to find all our parts relatively cheap so we don't go over budget. So we have to decide which parts are the most important, which will determine our dependencies. The heating coil is dependent on the high current driver and how much current it can produce. The higher current driver is dependent on the microprocessor. The microprocessor must be able to communicate with the driver and also with the user interface and temperature sensor. If we want the top heating element to be independent of the bottom one, we need two different high current drivers. An example of why this would be appropriate is if we wanted to broil something like fish. Broiling only uses the top heating element. Another part of our project will be housing the heating elements and making sure they do not start on fire. A metal frame would be appropriate for housing the project. Michael Larson and Peter Choudek are Seniors in the Electrical Engineering program at St. Cloud State University. They have completed ABET accredited classes through the University up until this point.

**Abstract Code:** 3MT1

**Presenter(s):**

Samantha Mills

**Faculty Mentor(s):**

Matthew Tornow

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Paleoenvironment of the Late Eocene Whitehead Creek Locality

**Abstract:** Toward the end of the Middle Eocene (40-37mya), the environment started to decline on a global scale. It was becoming more arid, the tropical forests were disappearing from the northern latitudes, and there was an increase in seasonality. Research of the Chadronian (37-33.7mya) in the Great Plains region has documented the persistence of several mammalian taxa, for example primates, that are otherwise extinct. This research aims to investigate the circumstances surrounding the persistence of these relict taxa (e.g. primates) in the Great Plains. More specifically, it seeks to interpret the environmental conditions that might have allowed these relicts to persist in the Great Plains after their extinctions elsewhere. The goal of this project is to better understand the community ecology at one fossil locality, the Whitehead Creek locality, Nebraska, for the purpose of reconstructing its paleoenvironment. To address the paleoenvironment at Whitehead Creek, I evaluated locomotor guilds of morphospecies, recognized through visual assessment and PCA, of 56 astragali and 43 calcanei. 54 terminal phalanges were evaluated morphometrically. Locomotor guild frequencies of small mammals (< 1,000g) for both Whitehead Creek and modern biomes were compared using both the Euclidean Distance method and Sørensen's similarity index. Results indicate that small mammals at Whitehead Creek practiced a wide range of locomotor activities including leaping, digging, climbing, and running in both arboreal and terrestrial habitats. Comparisons suggest that the environment at Whitehead Creek is different from all modern biomes but has a structure that's similar to a gallery forest from the Cerrado of Brazil. The mixture of locomotor categories found at Whitehead Creek suggest that I've got a mosaic of shallow, braided streams that're bordered by humid-subhumid "tropical" forests. These gallery forests are bordered by a narrow strip of seasonally-moist grassland. Open woodland forests border this narrow strip of seasonally-moist grassland.

**Abstract Code:** 3MT2

**Presenter(s):**

Zachary May

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Evolution of Body Shape in the Deep-Sea Hatchetfishes (Sternoptychidae)

**Abstract:** Stomiiformes (dragonfishes and their allies) are a species-rich order of fishes (~440 species) that are primarily found throughout the meso-bathypelagic zone of the world's oceans. The bodies of Stomiiformes are covered in an array of bioluminescent photophores that produce light in their near-dark to dark environment. In contrast to the more elongated body plan of most stomiiform fishes, the family Sternoptychidae (hatchetfishes, ~78 species) has evolved a hatchet-like body shape. Few studies have investigated the evolution of body shape among stomiiform fishes, a lineage that has evolved exclusively in a pelagic deep-sea environment. In this study we use landmark-based geometric morphometrics to examine the differences in body morphology across the family Sternoptychidae. We also explore the evolution of body shape among hatchetfishes in the context of their evolutionary relationships inferred from a synthesis of genome-scale sequencing with ultraconserved elements and protein-coding gene fragments.

**Abstract Code:** 3MT3

**Presenter(s):**

Emily DeArmon

**Faculty Mentor(s):**

Matthew Davis

**Husky Compact Dimension:** Act with Personal Integrity and Civic Responsibility

**Title:** Evolutionary Relationships of Dragonfishes (Stomiidae) with a Survey of Anatomical Variation of their Bioluminescent Barbels

**Abstract:** The deep-sea is a highly understudied habitat where species richness was previously thought to be low due to the lack of geographical barriers. Prior studies have hypothesized that marine lineages living in open-ocean habitats may exhibit lower species richness due to a reduction in genetic isolation among populations. The order Stomiiformes consists of four deep-sea families (~520 species) and have adapted a variety of endogenous bioluminescent organs. The most speciose family, dragonfishes (Stomiidae), is recognized for having species-specific bioluminescent barbels and have been primarily identified through this structure. These barbels are found on the base of the urohyal bone with high variation of anatomical features along the stem and tip, containing luminous tissues. These barbels are hypothesized to be used for prey attraction and communication. Anatomical structures of the barbels can range from simple and elongate stems to the possession of complex structures. These structures include bulbs and bulblets, filaments, and branching networks, as well as flattened/nonbulbous structures. Barbel length can span from less than the head length to six times greater the standard length of the fish (Grammatostomias). The genus, Eustomias, contains over 100 species and includes the most anatomically diverse and complex barbels within Stomiidae. Three genera Astronesthes, Melanostomias, and Idiacanthus, have even been recognized to have sexually dimorphic barbels. While most stomiids possess high morphological variations in their barbels, three genera, Chauliodus, Photostomias, and Malacosteus, completely lack this appendage. In this study we investigate the evolution of barbels across dragonfishes including a character evolution study in the context of a dragonfish tree of life to understand the evolution of this light producing appendage.