

# **Journal of Scholarly Endeavor**

2024

Symposium for Student Research,  
Scholarship and Creative Achievement

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#### MESSAGE FROM THE PROVOST AND VICE PRESIDENT FOR ACADEMIC AFFAIRS

The SRU The Symposium for Student Research, Scholarship, and Creative Achievement is, among other things, an opportunity to showcase the outstanding work being done by our students. Across campus, students are engaged in significant scholarly and creative activities with the mentorship and support of our expert and dedicated faculty. The Symposium also represents the commitment SRU has to encouraging interdisciplinary research that invites collaboration and the exploration of issues from multiple perspectives. The symposium represents a pathway towards achieving **Pillar #1 of SRU's Strategic Plan**, to ensure that all faculty, staff and students have the support and resources necessary to thrive.

One of the important differences that sets university education apart from primary and secondary education is that the university mission includes the creation of knowledge, not simply its transmission. This is why faculty responsibilities include scholarly growth alongside teaching as requirements for tenure and promotion. At SRU, we go farther, and include students in this fundamental aspect of the university mission. We do this because we are committed to the idea that we learn best by doing. Working side-by-side with their faculty mentors, students can learn what it means to face open-ended questions and construct new answers and meaning beyond what has existed before.

Through the Symposium, we have the opportunity to not only recognize students who have engaged in this type of work, but also to continue their growth as creators-of-knowledge. Because engagement with their questions did not end when they put away their last piece of equipment. After “completing” their study, the real challenge began, as they had to grapple with the best way to synthesize and communicate their results. So, in a sense, they now become the teachers – sharing their newly discovered ideas with those of us who attend their presentations and ask them questions, or who read their abstracts in the *Journal of Scholarly Endeavor*.

In conclusion, I want to extend my deepest appreciation to the faculty who have mentored these students. Without your time and dedication, students would not have had these opportunities. I also want to thank the people associated with the Office of Grants, Research, and Sponsored Programs, particularly Casey Hyatt and Rachel Seminatore, who do the yeoman's work each year of organizing and running this event. And finally, thank you to the students who went above and beyond the minimum requirements of their degree programs, who made the commitment and followed through to a successful completion, and thus demonstrated the opportunities and potential of an SRU education.

Dr. Michael Zieg  
Provost and Vice President for Academic Affairs

# Accounting, Economics & Finance

## Is AI in Finance Ethical?

Conner Hamilton

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### Poster

#### ABSTRACT:

Artificial Intelligence in the finance industry is an incredibly hot topic. The looming possibility of a loss of jobs in the market hangs over us. As a result, fear of this loss shows itself and leaves many people afraid and worried about whether they can grow in the industry. Should this fear be warranted? Should we as industry majors be looking in another direction when looking for a major? Or are we in the best position to pounce in the downturn and fear of a failing market, and utilize artificial intelligence? Should we look at what is currently being created in the world of AI and use it to our advantage. Especially when companies all around the globe are pushing to go with artificial intelligence-based programs for their programs. Should we learn more about what it is these companies do in the current, and use the processes to build better, more innovative and effective programs for other fields? Or should we fight against the corporations and avoid AI, or should we accept it. More questions answered are how is the outlook for the future? Is it bright? Is it dull? Should we pursue AI, and make it a course for colleges to give students a look into where the field is going? If we pursue AI, is it a viable option? Will we be able to grow at the rate AI is? Should we trust this new technology? How risky is committing to AI? Is it ethical to use AI for human based functions? And if so, is it alright to take jobs from people, because an AI can do small tasks more efficiently? Is it reasonable to assume that AI can take jobs? Should we exit the field because of these technological advancements? These questions, as well as many more, lead to a conclusion of if we should react or not.

## Emotional Buying: Color Psychology in Advertising

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### Poster

#### ABSTRACT:

Advertising companies and brand creators can use color psychology to their advantage when trying to generate more sales from consumers. Many companies use color to evoke certain emotions that they want consumers to associate their products with. Much of the research available is for brand creators that are looking to create the perfect logo for their company with the correct colors. A few examples of this would be high-end luxurious brands that typically use black because of the feelings of power, luxury, and sophistication that is associated with that color. Red and yellow are often seen at fast food restaurants because red evokes a feeling of urgency and stimulates appetite with yellow being associated with happiness and optimism. After conducting research from scholarly articles, podcasts, and marketing videos, taking it a step further was necessary. Looking at many different examples of the video advertisements that are shown during television commercials or social media ads, it is clear that color psychology is used in the actual advertisements and not just the brands. Many of the colors used in the ads reflect the color of the brand to evoke those same feelings in the consumer and bring their company's goal to life. Understanding the impacts of color can help consumers buy products more consciously and purposefully rather than letting emotions affect their decision making.

# Biology

## Validation of Crayfish Hemolymph Glucose Measurement Using a Point-Of-Care Glucometer

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### Poster

#### ABSTRACT:

Animals must respond to diverse environmental stressors in maintenance of homeostasis. Concentration of glucose in animal body fluids is a well-established metric of metabolic stress response. Traditionally, glucose concentrations have been determined using enzymatic assays that require completion in a laboratory setting due to sample handling and equipment constraints. These established assays are relatively technical, expensive, and lack portability, restricting their use in field settings for studies of wildlife. Point-of-care (POC) glucometers have become an important tool for human glucose monitoring, and their use has been adopted by researchers investigating metabolic responses in other animals. However, the use of POC devices for measurement of glucose in invertebrate hemolymph has not been as extensive and an understanding of the correlation of POC results compared to traditional assays is warranted. In this ongoing study, we will compare results of hemolymph glucose measurements in the Virile Crayfish (*Orconectes virilis*) using both a POC glucometer and the traditional laboratory-based method. The sublethal effects of stressors on aquatic invertebrate physiology are relatively less studied and crustaceans, such as crayfish, could represent an indicator of response to environmental conditions. The refinement of an alternative technique, such as POC glucometers, for measurement of hemolymph glucose in settings outside the laboratory could be valuable for investigations of basic physiology as well as conservation efforts.



## **A Survey of Intestinal Parasites in Well-Cared for Horses at a Local Equestrian Facility**

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### **Poster**

#### **ABSTRACT:**

A study was conducted to examine the burden of Strongyles in well-cared for horses at a local equestrian facility. The McMaster technique was used to determine the number of eggs per gram (epg) of fresh fecal matter from each of eighteen (18) horses. Preliminary results indicated that sixteen (16) of these horses presented with Strongyles. Eleven of the 18 horses were potential high shedders (> 500 epg), while 1 was a medium shedder (between 200-500 epg) and the remaining 6 were low shedders (< 200 epg). Despite being well-cared for horses, the presence of Strongyles points to the need for continuous surveillance (observation and treatment) to monitor parasite burden while also assessing any emergence of drug resistance.

## Impact of Native vs. Non-Native Litter on Earthworm Foraging Activities

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### Poster

#### ABSTRACT:

During the last glacial period, earthworms native to the Eastern United States were extirpated from glaciated regions, resulting in eastern North American forests to develop without the presence of earthworms for at least the last 20,000 years. Now, non-native earthworms from Asia and Europe have been introduced to these forests. This introduction potentially affects ecosystem composition and function by changing soil composition, altering carbon: nitrogen ratios, and decreasing phosphorus abundance. By altering the soil composition and chemistry, these non-native earthworms have a cascading effect on forest plant communities. This study seeks to examine the relationship between a non-native earthworm, *Eisenia foetida*, and their interactions with both native and non-native plant litter types. We hypothesize that *E. foetida* will decompose invasive *Reynoutria japonica* (Japanese Knotweed) at a greater rate than native plant *Impatiens capensis* (Spotted jewelweed). 100 earthworms have been placed in a propagation bin, where they have been surviving and reproducing for approximately 2 months. Individuals from the propagation bin will be randomly sampled and placed into constructed mesocosms containing 1 gram of either *R. japonica*, *I. capensis*, or a control of oak (*Quercus sp.*) leaves. These mesocosms will be randomly sampled over 1 week, 2 week, and 4 week periods for changes in plant biomass. It is our goal for this study to determine if there is a positive relationship between invasive earthworms and non-native plant litter. Future experiments are planned to study the effects of using a mixed-species assemblage of earthworms, as well as the effects of using cardboard as bedding material in the mesocosms on earthworm diets.

## Critical Thermal Maximum in Semiterrestrial Fiddler Crabs and Aquatic Long-Clawed Hermit Crabs

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### Poster

#### ABSTRACT:

Anthropogenically-driven climate change is rapidly altering ecosystems worldwide. Coastal ecosystems offer a unique opportunity to assess thermal responses among members of the crab-scavenger guild, which provide essential ecosystem services in wetlands. This study assesses the critical thermal maxima ( $CT_{Max}$ ) of three coastal crab species to investigate potential effects of increased temperatures associated with climate change. Crabs were collected at Assateague Island (VA, USA) in August 2023. Semiterrestrial sand fiddler crabs (*Uca pugilator*, n=5) and mud fiddler crabs (*Uca pugnax*, n=5) were captured by hand, while aquatic long-clawed hermit crabs (*Pagurus longicarpus*, n=5) were collected via seining. Fiddler crabs were placed individually in an egg incubator and temperature was increased 1°C per minute from room temperature (23°C) until onset of spasms. Long-clawed hermit crabs were placed individually in a tank with water and a water heater, and temperature was increased at 1°C per minute from room temperature (23°C) until they lost the ability to right themselves within 30 seconds when flipped onto their backs. Sand fiddlers ( $48.36 \pm 2.22^\circ\text{C}$ ) were no different than mud fiddlers ( $48.22 \pm 1.09^\circ\text{C}$ ) in  $CT_{Max}$  ( $F=112.3$ ,  $df=2$ ,  $p=0.989$ ). Both fiddler species were significantly different ( $p<0.001$ ) than hermit crabs ( $35.32 \pm 1.16^\circ\text{C}$ ) in terms of  $CT_{Max}$ . Tukey's HSD *post hoc* values were determined at  $p<0.001$  significance level. We hypothesize that different  $CT_{Max}$  responses by crabs are due to different thermal regimes (e.g. specific heat capacity, irradiance, conduction, thermal refugia, thermal range) of aquatic and semiterrestrial environments. Future studies should investigate risks for hyperthermia including diurnal feeding at low tides by fiddler crabs and long-clawed hermit crabs in tidepools.

## **Utilizing RNA-seq to Understand the Molecular Effects of Sublethal Concentrations of Imidacloprid in the Human Cell Lines SHSY5Y and MCF7**

Ashton Reposky and Lia Slifkin

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### **Poster**

#### **ABSTRACT:**

Imidacloprid (1-(6-chloro-3-pyridylmethyl)-N-nitroimidazolidin-2-ylideneamine) is one of the most widely used insecticides in the world. Imidacloprid functions by specifically binding with high affinity to nicotinic acetylcholine receptors found in the nervous system of insects. Binding of imidacloprid to nicotinic acetylcholine receptors triggers sustained contractions of muscles leading to paralysis and death. Imidacloprid is a systemic pesticide designed to enter the plant and move into growing tissues to prevent insect herbivory. Because of the systemic properties of imidacloprid, it is often applied through seed coating, soil drenching and foliar spraying. These applications provide many routes for imidacloprid exposure. Imidacloprid has been found in fresh and processed vegetables and fruit, as well as water, soil and sediments globally. Imidacloprid is described as more selective for insect nicotinic acetylcholine receptors than mammalian due to critical molecular structure differences between species, though evidence is suggesting there are off target effects on vertebrates by this pesticide. However, imidacloprid displays sublethal effects on human cells, such as aneuploidy, DNA damage, lipid accumulation and hormone dysregulation. Importantly, not all the cell lines tested in these studies were acetylcholine receptor expressing cells, reinforcing the idea that the insecticide may have off-target effects. Notably, little is known about the molecular underpinnings of the sublethal effects of imidacloprid in human cells. To fill this gap in knowledge, I have initiated a research project to utilize RNA-seq to examine the effect of five sublethal doses of imidacloprid (0.1uM, 1uM, 10uM, 100uM and 1mM) on the expression of genes in the neuroblastoma cell line SH-SY5Y (express nicotinic acetylcholine receptors) and the breast cancer cell line MCF7 (do not express nicotinic acetylcholine receptors). In this poster, I will detail my experimental design and preliminary results.

## Toxicity of the Rare Earth Elements Towards Bacteria

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### Poster

#### ABSTRACT:

The field of microbe-metal interactions has been gaining significant attention. While studies have been carried out related to the direct impact of oxyanions of metals and metalloids on bacteria, a significantly lower amount of attention has been placed on the toxicity of the Rare Earth Elements (REE). With more products containing REE (ie. solar panels, electric motors, batteries), they are appearing in landfills/waste sites at a higher rate. The result is more of these elements entering the environment and thereby interacting with the microbial community. The trouble with this is so little is known regarding their toxicity to bacteria. We know that many other metals, and especially other heavy metals, (such as Lead, Silver, Mercury, and Copper) are highly detrimental to microbes, so it reasons that the REE will also be highly toxic. In this study, we looked at the effect of the REE on the growth of eight bacterial isolates which had previously been shown to possess metallophore activity towards the REE, suggesting that they may have some kind of innate resistance to these elements. Our findings indicate that this is somewhat true, with some of the REE appearing highly toxic, while others not as much. It would appear that among all 16 of the REE tested, there is no common trend, with toxicity being more metal dependent than broad overall generally identical toxicity.

## Developing a Novel Protocol for Harvesting and Culturing Stem Cells Using the Endemic Planarian *Phagocata gracilis*

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**Oral**

### ABSTRACT:

Planarian flatworms are well known for their regenerative ability, making them an increasingly attractive model organism. *Phagocata Gracilis* is indigenous to western Pennsylvania and has been the subject of our recent experiments in which we have examined the effects of exogenous melatonin on planarian head regeneration. Our initial studies have directed our focus into two directions: pulse melatonin treatments and neoblast isolation experiments. A neoblast consists of proliferating, undifferentiated stem cells that collect at the site of amputation. The ability to isolate and culture these cells will allow us to better understand how cell-to-cell interactions and signaling impact their differentiation and development in the regenerative process. In this study, we used our melatonin exposure data to identify timepoints in head regeneration to isolate the neoblast. We then tested various instruments and media to identify a protocol that would allow for successful maintenance of the isolated neoblasts. In continuing studies, investigation of lineage-specific cell signals can be conducted in the isolated neoblasts, and applications can be made across a wide array of topics including stem cell biology, gene and signaling pathways, tissue repair, and the effects aging have on these processes.

## Taxonomic Classification T9W2-O, A Bacterium Isolated from the Roots of the Aquatic Plant *Salvinia minima*

Katelyn Sparks, Nathan Guy and Jonathan Franks

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### Poster

#### ABSTRACT:

The study of bacteria has been an ongoing process for hundreds of years. While the field itself covers broad areas, one of the cornerstones is accurate and definitive classification of individual isolates. Through a polyphasic approach, including classical physiology and biochemical testing along with 16S rRNA gene analysis and genome sequencing, a vast number of bacteria have been officially identified, however, in spite of our best efforts, less than 1% of all bacteria have actually been properly taxonomically classified. Over the past several decades, the field of microbiology has made significant advances in the area of molecular analysis which have resulted in much more accurate classification methods. To this end, we found an environmental isolate from the roots of the aquatic plant *Salvinia minima*, which we hypothesized to be a new bacterial species. A polyphasic taxonomic study was carried out on this strain, T9W2-O<sup>T</sup>. Nearly complete 16S rRNA gene sequence homology related the strain to *Chryseobacterium*, with 98.8% and 98.5% similarity to *C. profundimaris* and *C. takakiae*, respectively. Computation of average nucleotide identity and digital DNA–DNA hybridization with the closest phylogenetic neighbor of T9W2-O<sup>T</sup> revealed genetic differences at the species level, further substantiated by differences in several physiological characteristics. Based on light and electron microscopy, cells are rod shaped and non-motile. The fatty acid profile, polar lipids, and quinones are all characteristics of the genus *Chryseobacterium*, as is the DNA G + C content of 37.0 mol %. On the basis of results obtained, this bacterium is assigned to the genus *Chryseobacterium* as a new species with the name *Chryseobacterium salvinia*.

## **Taxonomic Classification T5W1, A Bacterium Isolated from the Roots of the Aquatic Plant *Spirodela polyrhiza***

Karlie Vandeborne, Nathan Guy, and Jonathan Franks

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### **Poster**

#### **ABSTRACT:**

The study of bacteria has been an ongoing process for hundreds of years. While the field itself covers broad areas, one of the cornerstones is accurate and definitive classification of individual isolates. Through a polyphasic approach, including classical physiology and biochemical testing along with 16S rRNA gene analysis and genome sequencing, a vast number of bacteria have been officially identified, however, in spite of our best efforts, less than 1% of all bacteria have actually been properly taxonomically classified. Over the past several decades, the field of microbiology has made significant advances in the area of molecular analysis which have resulted in much more accurate classification methods. To this end, we found an environmental isolate from the roots of the aquatic plant *Spirodela polyrhiza* which we hypothesized to be a new bacterial species. A polyphasic taxonomic study was carried out on this strain, T5W1<sup>T</sup>. Nearly complete 16S rRNA gene sequence homology related the strain to *Pseudomonas*, with 99.38 % similarity to *P. guineae* and *P. peli*. Computation of average nucleotide identity and digital DNA–DNA hybridization with the closest phylogenetic neighbor of T5W1<sup>T</sup> revealed genetic differences at the species level, further substantiated by differences in several physiological characteristics. Based on light and electron microscopy, cells have a rod-coccus lifecycle with the presence of typical coryneform shapes as well. The fatty acid profile, polar lipids, and quinones are all characteristics of the genus *Pseudomonas*, as is the DNA G + C content of 59.3 mol %. On the basis of results obtained, this bacterium is assigned to the genus *Pseudomonas* as a new species with the name *Pseudomonas spirodela*.



## **Assessment of HSP70 and HSP90 Protein Expression in Human Neuronal Cells Exposed to Imidacloprid**

Melana Vaughn

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### **Poster**

#### **ABSTRACT:**

Imidacloprid is a nicotinamide derivative insecticide that is commonly used in the United States as means of agricultural pest control. It is highly water soluble and able to be dispersed through the tissue of plants by being taken up through the roots. Imidacloprid is selective for insect nicotinic acetylcholine receptors, but many studies have observed negative effects of neonicotinoids on vertebrates and other nontarget organisms. Importantly, imidacloprid can be absorbed in human intestinal cells, indicating humans are being exposed through contaminated food, but the long-term impacts in humans are still largely unknown. The purpose of this study is to utilize western blot analysis to determine the relative amount of Heat Shock Protein 70 (HSP70) and Heat Shock Protein 90 (HSP90) produced in human neuronal cells (SHSY5Y) in response to exposure to varying levels of imidacloprid. HSP70 and HSP90 are part of the cell stress response pathway. They help to bind and prevent protein misfolding and aggregation due to heat and chemical stress. If a cell is under stress it may increase the expression of these proteins. Therefore, it is hypothesized that the amount of HSP70 and HSP90 should increase in neuronal cells following imidacloprid exposure.

# Chemistry

## **Studying the Behavior of Holmium and its Interactions with a Multi-Dentate Ligand to Model Analogous Behavior in Bacteria**

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### **Poster**

#### **ABSTRACT:**

Metals are a vital resource in society. From biological systems to technology, most fields of study involve metals in some way. This study focuses on using the natural systems of bacteria to recycle rare earth metals, particularly lanthanides. These are a series of metallic chemical elements that are popularly used industrially and in electronics. With many issues regarding the environment and economy in the world, it is important to look for new ways to use resources in a sustainable and affordable way. Bacteria that contain a large amount of siderophores have been found to have high potential in recovering and recycling metals, especially iron, because siderophores have strong metal-chelating properties.<sup>1</sup> Using siderophores has recently been applied to lanthanides and the discovery of selective recognition and uptake in biological systems, which can be further studied in applications of recycling these metals.<sup>2</sup>

In this study holmium (Ho), an element within the group of lanthanides with a high affinity for oxygen, is used. A sequestering ligand containing many oxygens was used to observe the interaction between Ho and the oxygen rich ligand. This ligand was chosen to mimic how bacteria may sequester metal ions. The holmium and ligand interactions were monitored with UV-Visible spectroscopy under multiple conditions, including varying concentration and pH. Characteristic peaks appeared at wavelengths of 450 nm, 540 nm, 640 nm, with 540 nm being the most pronounced. These were particularly used to monitor and observe changes that occurred in the different conditions the solutions were exposed to.

## FAME Analysis of Bacterium Isolated from an Acid Mine Drainage Stream

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### Poster

#### ABSTRACT:

Fatty acid methyl ester (FAME) analysis can be used to classify new genera of bacteria. The bacteria of interest, with genus *Gordonia*, can be used in the study of resistance to heavy metals. In this study, gas chromatography-mass spectrometry (GC-MS) is used rather than gas chromatography (GC) due to the ability of the GC-MS to report masses of compounds and the identity of the compounds. For the analysis of the FAME, the fatty acids of the bacteria were extracted and then methylated to produce derivatized methyl esters of the fatty acids. When there is a mixture of various compounds, separation parameters need to be set to separate these compounds from one another. GC-MS separates these compounds based on boiling points. These compounds are then ionized and passed through the GC for characterization. Separation parameters such as temperature, time, pressure, and split/split less modes were optimized to effectively separate the methyl esters. When optimizing the separation parameters, the metric used to verify effectiveness was increasing the separation of compound peaks. The degradation of methyl esters containing a 3-OH moiety to aldehydes was later observed when working with different genera of bacteria containing 3-OH. When these aldehydes were observed, the reduction of their ionization was another metric to measure effectiveness. Upon optimization, the ionization of these aldehydes was not completely reduced. However, a correction factor was determined using known standards and implemented to account for the resulting missing abundance of 3-OH. After the correction factor was implemented, it was found that the most abundant methyl esters in the bacteria were iso C15:0 (30.5%), iso C15:0 2-OH (10.2%), iso C17:0 3-OH (20.6%), and iso C17:1 w9c (20.8%). These peaks of unknown bacteria were consistent with other known bacteria in a comparison genus.

## Potential Novel Pharmacological Approaches for the Treatment of Alzheimer's Disease

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### Poster

#### ABSTRACT:

Alzheimer's Disease (AD) is a progressive, neurological disease that slowly destroys key regions of the brain associated with memory and cognition. Currently, there is no cure for AD, and FDA-approved treatments only relieve symptoms and come with many negative, unwanted side effects. Furthermore, research and treatment targeting the role of cholinergic receptors is being exhausted. The rationale behind this study design stems from new evidence showing how activation of cannabinoid (CB) receptors may inherently affect other receptors, such as cholinergic receptors. This idea, known as crosstalk, suggests that sole activation of CB receptors may alter cholinergic signaling, a key receptor responsible for AD's symptomologies. Therefore, the significance of this project will seek to investigate the role of CB receptors as a potential new drug target for AD. Methods will include transfection of a CB1 or cholinergic receptor plasmid in an N2a cell line. These cells will then be exposed to a treatment condition, such as the commercially available synthetic cannabinoid WIN55,212-2, and data will be collected to determine changes in receptor density on the cell membrane as a result of treatment conditions, including measurement of receptor expression and colocalization. If CB receptor activation can be tied to activation of the cholinergic system, then the CB receptors could be targeted in place of cholinergic receptors to potentially activate the same system with more efficacy or fewer side-effects. If successful, the use of synthetic and or commercially available cannabinoids, such as delta-9-tetrahydrocannabinol (THC), could be investigated as a potential treatment for AD.

## Using a Synthetic Ligand to Model Holmium-Binding by Bacteria

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### Poster

#### ABSTRACT:

Rare earth metals are crucial to manufacturing many components featured in modern technology. The largest deposits of these rare earths are located abroad, combined with how often they are used, has led to concerns about the economics associated with using these metals. The environmental damage caused by mining these metals has also raised concerns. Thus, if new technologies are continued to be manufactured, there needs to be a way to safely recycle rare earth metals. We propose that bacteria containing molecules capable of binding these metals, called ligands, could uptake these rare earth metals, such as yttrium and holmium, will be a safe and green way to recycle the rare earth metals. Our current work uses a synthetic ligand known as H<sub>2</sub>salpn that may mimic the active binding site in metal bacteria. We have tested the binding abilities of H<sub>2</sub>salpn to see if it will bind various concentrations of holmium. This has been measured using FT-IR and UV/vis spectroscopy to find if the metal will bind the ligand. Binding can be seen as shifts in the FT-IR and UV/vis data when compared to the FT-IR and UV/vis data of pure H<sub>2</sub>salpn. If H<sub>2</sub>salpn binds these rare earth metals, it would be a perfect model for understanding how bacteria uptake and bind metals. We present our efforts in finding a ligand to bind rare earth metals in order to recycle the metals and continue the manufacturing process of new technologies.

## Electrochemically Induced Iron Uptake by Recombinant H-Chain Ferritin

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### Poster

#### ABSTRACT:

Ferritin is a large protein that sequesters excess iron from the cell. Mitochondrial ferritin (MtFt) is the ferritin specifically found in the mitochondrion, the organelle where the chemical energy for the cell is generated. While cellular ferritins are composed of different proportions of H-chain and L-chain subunits MtFt exists as only one kind of subunit, resembling cellular H-chain. In addition, MtFt catalyzes the oxidation of iron as does H-chain. We sought to examine the electron transfer properties of MtFt to characterize its reactivity toward iron. Given its similarity to MtFt, we first investigated the expression, purification, and electrochemical properties of recombinant H-chain ferritin (rHF). BL-21 cells were transformed with a plasmid containing the H-chain gene. Following expression of rHF, the cells were lysed, and the rHF was extracted and purified by heat denaturation and size exclusion chromatography. Reconstituted rHF was covalently attached to gold electrodes using zero-length coupling reagents, and the voltammetry showed that rHF reduces at -0.35 V versus the Ag/AgCl reference electrode. Gold-apo-rHF electrodes were immersed in buffer containing ferrous sulfate at positive potential. Cyclic voltammetry revealed that iron uptake was electrochemically induced.

# Computer Science



## **Blockchain Technology for Decentralized Crowdsourced Data Analytics**

Tyler Powell

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### **Poster**

#### **ABSTRACT:**

This abstract presents a pioneering, decentralized data access and control framework for managing data crowdsourcing from the Operations Monitoring and Notification Infrastructure (OMNI) at the National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory. Utilizing blockchain technology, our proposed system will offer a trustworthy and managed platform that ensures easy access to real-time operational data for researchers, while rigorously upholding the confidentiality, integrity, and availability (CIA) triad of information. Critically, it will also ensure the traceability of the crowdsourced data. This framework will integrate seamlessly with the existing OMNI infrastructure and extend its functionality to enable crowdsourcing of operational data to external users.

Our methodology involves implementing and examining the efficiency of three consensus algorithms: Proof of Authority, Practical Byzantine Fault Tolerance (PBFT), and the Federated Byzantine Agreement (FBA). Each algorithm will be tested to evaluate its performance and suitability for our proposed framework. This comparison will enable us to select the most efficient mechanism to safeguard the system against malicious activities and failures, thereby enhancing the reliability and security of our system. The conclusions derived from this study will provide valuable insights for the broader research community engaged in the advancement of convergent computing platforms and big data applications.

# Counseling and Development

## **College Counselor Burnout and Differentiation of Self: Preliminary Findings**

Emily Grimes and Megan Gallo

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### **Poster**

#### **ABSTRACT:**

In the last twenty years, student demand for counseling services on college campuses has faced a drastic increase. However, the capacity for college counseling centers to effectively address student needs has not increased equivocally. The rising demand coupled with a lack of resources has led to college counselors carrying higher client caseloads that often include more students with significant mental health concerns (i.e. higher acuity) (CCMH, 2021). Additionally, since the COVID-19 pandemic, student mental health has garnered increased attention from campus' stakeholders. In spite of this, the effect of these circumstances on college counselors—professionally and personally—has yet to be explored at-length. Specifically, burnout presents itself as a looming and compromising threat to both quality-of-care for students and the physical and emotional health of college counselors (Dyrbye et al., 2008; Melamed et al., 2006). The present study seeks to explore the issues and themes surrounding college counselor burnout as well as counselors' sense of self and ability to manage chronic anxiety. Preliminary findings of our nationally sourced, self-report, mixed method study will be reviewed, in addition to the discussion of initial suggestions to systemically mitigate burnout among college counselors.



# Criminology and Criminal Justice

## **Nationwide Content Analysis on State Police Force's Use of Force Policies**

David Duffey

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**Oral**

### **ABSTRACT:**

In recent years, police agencies have come under heavy scrutiny due to excessive force used by police officers. Due to these incidents, the use of force by police officers has become an essential topic of discussion nationwide. The research conducted in this thesis examines the different use-of-force policies of varying state police forces nationwide. The central goal is to highlight the critical elements found throughout each state's use of force policy to shed light on the similarities and differences state police policy can have regarding an officer's use of force. The current literature surrounding police use-of-force policies is included to highlight significant prior research conducted on the topic. The research method utilized involved the collection, review, and analysis of states' police agency's use of force policy that was publicly available. The thesis employs a content analysis to examine the textual data throughout these policies to uncover the key themes and concepts. By providing an in-depth analysis of states' leading law enforcement agency's use of force policy, this thesis contributes to the ongoing discussion toward law enforcement practices that will benefit current and future policymakers, the public, academic scholars, and law enforcement agencies.

## **Coping and Stress-Reduction Groups for Incarcerated Individuals with and without Animal-Assisted Support**

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**Oral**

### **ABSTRACT:**

Individuals who are incarcerated are often stressed, hopeless and overwhelmed by this difficult life circumstance. Jails, unfortunately, offer little treatment to assist in enhancing coping, and fostering hope and resilience. This research study provided four six-week coping and stress reduction groups, two with therapy dogs (AA=animal-assisted) and two without therapy dogs (non-AA). Twenty-four participants in all benefitted from these groups with significant reductions in stress, improved resilience, and increased sense of hope. Evaluation of the groups separately showed the non-AA group was significantly less stressed and more hopeful after the intervention, and the AA group was significantly more hopeful. Qualitative comments from the participants revealed that both groups rated the interventions as very helpful.

# Dance



## Connection Without Touch: Analyzing William Forsythe's *Duo*

Gabrielle Dunn

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### Oral

#### ABSTRACT:

When one imagines choreographing for two, one likely envisions two dancers, their bodies intertwined both physically and emotionally. The choreographic principle of contact can be seen in ballet pas de deux: a traditional duet danced in ballet, ballroom partnerships, and in evolving modern and contemporary styles. However, it is important to note that intimacy does not equal physical contact. As artists, including dancers, choreographers, and audience members, one may question if a duet can remain contactless while still conveying a connection between the two dancers. Created in 1996 for Ballett Frankfurt, William Forsythe's *Duo* is a notable duet that does not use physical contact. In the ever-evolving field that is dance, along with society itself, it is imperative to be able to choreograph under various constraints, such as eliminating common choreographic tools used including physical contact. Forsythe's varied career as a choreographer lends to his work *Duo* and the use of non-physical contact between two dancers in the duet. A primary source in conducting this research was *Processing Choreography: Thinking with William Forsythe's Duo*, which provides an in-depth analysis of Forsythe's work *Duo*, written by former Forsythe dancer Elizabeth Waterhouse. Much of her information helps to establish the theory that connection can be made without physical contact. This connection is created and differs from physically connected duets through four means: flexible gender roles, a breath score, the use of counterpoint, and a loose narrative structure. As a BFA student in the Department of Dance, I am applying my research findings to the construction of my current choreographic process that will be presented in the 2024 BFA Capstone Concert. I am working with six dancers, each having a duet partner, which allows me to apply these choreographic principles I have researched to incorporate both physical and non-physical partnering into this piece.

## **The Tokenism, Labeling, and Othering Within Dance Education: A Push for True Cultural Representation**

Ericka Morton

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**Oral**

### **ABSTRACT:**

The term “dance,” as simple as it may sound, involves many complexities and layers that every individual who participates explores in their own way. On the surface, dance seems accessible for everyone, but in reality, it holds many biases that “other” dancers and movement forms from cultures that are not European. La Teesa Lanéa Ayo Walker’s dissertation titled “Towards Intercultural Engaged Pedagogy: Revisioning Curricula in University Dance Studies from a Black Dance Aesthetics Approach” served as a critical source when evaluating the reform of cultural representation within dance education and higher educational learning. Dancers of color are often not exposed to movement that reflects their culture in an academic or studio setting. Whereas it is given to them through a course labeled as “dance of a selected culture,” “world dance,” or through an “ethnic dance” unit or course. Is that really a fair classification of the class or is this incorporation just a way to check off a Diversity, Equity, and Inclusion (DEI) element in education systems? Education systems at large, but in this case dance in higher education, need to consider their implicit biases to students of color and adjust the way courses are titled and how they are presented to students. Elements of other cultures besides a western perspective have vital information to offer students to make them an overall more versatile mover and allows for students of color to see their history and influence reflected within education. The need for reform and revision of course curricula is necessary and needs to take action soon.

## Research and Reconstruction of a Colombian Traditional Dance Form

Ericka Morton, David VanSlander III, Lily Staib, Katelin Baughn, Jaidin Broody-Walega,  
Alia Antón, Taylor Snyder, and Jayelle Dunning

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### Performance

#### ABSTRACT:

The main purpose of this research was to understand the socio-political and historic context in which the Colombian dance form called the *Mercumbé* was developed. A group of twelve SRU dance majors and professor Melissa Teodoro examined its chronological evolution from the early 20<sup>th</sup> century and embodied a contemporary version of the dance. The *Mercumbé* is a dance that was first practiced in the Caribbean region of Colombia. Inherent in the dance are historic, choreographic and musical qualities of both African and Spanish backgrounds. We engaged in historic and ethnographic research that permitted a better understanding of the origins, functions and aesthetics of the *Mercumbé*, that due to its ephemeral nature, and the effects of modernity and globalization has been constantly transforming and even disappearing in some geographical areas of the country. This research project examines the *Mercumbé* as a means to understand the cross-cultural dynamics between African and Spanish populations. Due to the insufficient literary-based sources that would have acknowledged and transmitted a portion of Colombian history from the perspective of the African populations, finding traces of an untold story through non-literal sources such as structured kinetic activity can be an investigative path taken towards uncovering buried truths.

This research opportunity allowed us to reflect on the concepts of cultural identity and historic heritage when studying a culture, foreign to our own. With the constant increase of Latin American populations and the proliferation of Latin American culture in the United States, it is important for younger generations to form a more accurate and impartial perspective of this culture. This educational opportunity presented us with essential research tools based on ethnographic methodologies This investigative approach is applicable to dance at many levels and will be substantially useful to us in future research inquiries.

## **Fusing Street and Contemporary Dance Styles**

Samantha Oliver

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### **Poster**

#### **ABSTRACT:**

Samantha Oliver began her research in “Fusing Street and Contemporary Dance Styles” in July ‘23 while attending Bates Dance Festival Professional Dance Program in Lewiston, Maine. This intensive was for three weeks, and she studied under Duane Lee Holland, Kimani Fowlin, and Abby Zbikowsk due to their integration of street dance styles and contemporary movement. This research aimed to advance her choreographic abilities through classes with seasoned professionals, which inspired her creative research. The faculty at BDF enhanced her artistry, performance quality, technical proficiency, and allowed her choreographic voice to deepen while aligning with SRU's strategic initiatives. Her research captured the choreographic process and the trajectory of her Slippery Rock University Dance Theatre and BFA Capstone fusion of choreography. Samantha created work that intertwined concert and commercial-based aesthetics for her choreography. For her SRUDT and BFA Capstone Research, she explored choreographing a solo and group work while collaborating with her dancers to provide a rich creative environment that informed the work. Her work has reflected street dance styles such as house and hip-hop social dances while exploring how the qualities of street dance can influence contemporary floor work. Samantha will present her creative movement research through a tri-fold poster presentation with video footage of her work. The presentation will include snippets of her work, a reflection on her BFA Capstone Research, and the importance of studying a fusion of styles together.

## **The Advantages of Yoga as a Movement Exercise for Women of All Ages**

Gabrielle Pfeifer and Samantha Oliver

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### **Poster**

#### **ABSTRACT:**

Samantha Oliver and Gabby Pfeifer started their research “The Advantages of Yoga as a Movement Exercise for Women of All Ages”, in the Spring of 2024 as an Independent Study under Melissa Teodoro. Both students received their 200-hour level Yoga Teacher Certification through the YTT program at SRU. Their research sparked when they immersed themselves in studying Yoga through a rigorous 1- week Yoga Workshop in Troncones, Mexico, Women in the Round. Their week of yoga training was a hands-on experience where they acquired knowledge of the many facets of yoga from teachers, lecturers, and the (other) women participants in this experience. Yoga is a beneficial movement exercise that helps all ages of women in any stage of their life. Specific yoga exercises can assist women in early development stages, puberty, prenatal stages, menopause, and elderly stages, and can instill discipline and confidence with its practice. Samantha and Gabby studied alongside many women participants in Mexico and learned about the benefits that yoga had on them. Part of their Independent Study involved the creation of detailed lesson plans that apply to these various populations of women and how to teach them effectively. Samantha and Gabby are both BFA Dance Majors and have already established a daily movement practice. They recognize what stage of life they are in and the benefits that yoga specifically offers them. Their research has positively strengthened their ability to become yoga teachers, specifically in their dance field where they can help dancers build strength, flexibility, confidence, and a daily movement routine to use in the future. They have gained tremendous knowledge in pedagogy, anatomy, meditation, injury prevention, recovery, and several other applications of yoga to dance. Yoga has multiple benefits that enhance the lives of many and should be practiced and shared - that is our goal. Samantha and Gabby will be presenting their research through a hand-made poster.

## **Dancing Through the Curriculum: Incorporating Dance into Elementary School Programs**

Amelia Risser

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### **Poster**

#### **ABSTRACT:**

In the age of constant technological advancements, the typical components of the elementary school classroom have drastically changed. School districts and teachers are turning to videos, games, and other technological resources to supplement their lessons, which, while partly educational, ultimately results in a stagnant group of students. It is essential that children receive adequate physical activity to enhance their focus and engagement in the classroom. An excellent way to keep students moving and learning is through dance. The art of dance is not typically taught in schools, but it is shown to have physical, cognitive, and emotional benefits for both students and teachers. Teaching dance in schools does not necessarily mean that students participate in ballet classes during math or reading—there are a plethora of ways in which simple movements can be incorporated into a lesson plan. Structured and unstructured movement breaks scattered throughout the day are easy, effective, and entertaining ways to consolidate physical activity and informative learning. Movement education is as essential as core subjects and can be used as a support method within those areas, while also enhancing the child’s personal development. Students need physical activity, socialization, and inclusive and safe environments now more than ever, which can be fulfilled by integrating dance into the curriculum. Movement education promotes inclusivity to English as a Second Language and special education learners by creating a sense of community among every student. My research is supported by authors Jane Bonbright, Anne Dunkin, and others, reflecting their studies on the impact of dance in the education system. “Dancing Through the Curriculum” discusses the benefits of bringing dance into the classroom, creating inclusive environments, and offering students alternate methods of learning. This research would be presented through a poster presentation.



# **Elementary Education** **and Early Childhood**



## **Fostering Global Perspectives in Pre-Service Teachers Through International Student Research**

Dylin Keener, Heaven Jacoway, and Ariana Daniels

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### **Poster**

#### **ABSTRACT:**

The individualized and sophisticated process of learning and development in young children can become further complicated by the lack of cultural references and context. The understanding and infusion of culture into education can improve comprehension, motivation, and engagement, in conjunction with students' awareness of their racial and ethnic identities. The purpose of this project is to research the culture and history of the Kalinago people, the last remaining Caribbean community of pre-Columbian indigenous Carib people on the island of Dominica, to develop an understanding of their culture, curriculum, and educational needs. This exploration will enable the researchers to interview school administrators, families, and other stakeholders in the educational community. This project will provide three faculty members and two students with the opportunity to hone their interview, data collection, and analysis skills to identify and highlight the unique learning needs of the indigenous Kalinago early childhood students.

# Geography, Geology and the Environment

## **A Tally of Events and Developments of the Norfolk Southern Train Derailment in East Palestine, Ohio**

Brock O'Block

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**Oral**

### **ABSTRACT:**

On February 3, 2023, a freight train derailed in the small town of East Palestine, Ohio that was carrying various kinds of hazardous materials. The derailment caused these hazardous materials to spill and eventually catch fire leading to one of the worst environmental disasters in U.S. history. The environment, human health, and wildlife were put in great danger that day, leaving a lasting impact. The people of East Palestine were left with unanswered questions as to what is taking place their community and what is being done to reverse the effects of this disaster. This study documents the events that took place on February 3<sup>rd</sup> and the following days leading up to the one-year anniversary of the derailment. Information was gathered from numerous sources to build detailed timelines of critical events and provide understanding of the hazardous materials that were released. The study also provides the effects on waterways, implemented legislation, cleanup operations, mapping of critical sites, and recommended sources for people to get the help they need. The overall purpose of this study is to organize the facts and details of the events following the devastating derailment and to give clarity to a curious and hurting community.

## Owens Lake: A Story Told from 438 Miles Above Earth

Chas Schaeffer

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**Oral**

### ABSTRACT:

Los Angeles, California relies critically on the snowmelt that flows east from the Sierra Nevada mountains. The water rights to this snowmelt were secured by the Los Angeles Department of Water and Power (LADWP) over one-hundred years ago. Owens Lake is a large saltwater lake on the eastern side of California. The entire ecosystem has been greatly impacted by the city of Los Angeles which is located almost 200 miles directly south of Owens Valley. After the first aqueduct to the city was completed in 1913, the lake began to dry up without an inflow from Owens River to sustain it. By the mid-1920s, Owens Lake was reduced to a mostly dry lakebed. The precipitates left behind have been eroded by wind into plumes of carcinogenic dust clouds for decades. Pressured by state law, the LADWP committed to a master plan to control the dust in 2013. Recently, through the action of drainage changes to keep dust down, and a confluence of incredibly unique meteorological events including an increased snowpack and Hurricane Hilary in 2023, the basin is refilling. This study will examine the refilling process and show the area of Owens Lake that has been refilled over the course of the last 40 months. Using data from the Landsat 9 satellite, we will process, pixel by pixel, a Normalized Difference Water Index (NDWI). NDWI values are classified through unsupervised classification to detect areas of water and land, comparing pixel counts employing change detection analysis to determine land area that has been inundated. Our preliminary interpretation is that the remediation efforts in addition to extreme precipitation events are refilling the lake to pre-1920 levels. Our results will feature time-lapse, satellite imagery that shows the change in seconds rather than months.

# History

## **Strategy 21: The Challenges of Bringing Pittsburgh into the 21<sup>st</sup> Century**

Andrew Ciavarino

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### **Poster**

#### **ABSTRACT:**

This paper argues that Strategy 21, while successful in bringing new economic avenues into Pittsburgh, the urban planning project largely held back the potential success of Renaissance II due to poor political planning, ambition, and the unresolved social issues enhanced by the Renaissances. Pittsburgh, Pennsylvania, has gone through many drastic changes in urban planning since the second half of the 20th century. Two of the major plans became known as Renaissances. These Renaissances, however, would bring their own unique problems to the people of Pittsburgh with their large, ambitious ideas. Renaissance II came in 1977 with Mayor Richard S. Caliguiri who had the goal of bringing new life into the city in the face of deindustrialization by reinvesting Pittsburgh's economy into new ventures as it moved away from steel. Renaissance II's initial efforts with local businesses saw little improvement. This resulted in the city seeing a spike in unemployment in 1985. That same year, Mayor Caliguiri and the Allegheny County Commission proposed Strategy 21 as a framework for moving forward with the Renaissance. Strategy 21 focused on enhancing technological developments and strengthening the relationship with local high-level universities, where it failed was navigating the local and federal government and managing the ambitious ideas of city officials. This paper uses a collection of primary sources from the *Pittsburgh Post-Gazette* and various secondary sources on the effects of deindustrialization in Allegheny County. Where this paper differs from other historical analyses of the period, many historians view Strategy 21 as a side effect of the times. I, however, argue that it is a significant cause in the story of Pittsburgh's push away from its industrial roots.

## The Unconventional Diplomacy Between Empress Dowager Cixi and Katharine Carl

Emily Frantz

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### Poster

#### ABSTRACT:

The early twentieth century marked new political change both in the United States and China, particularly for the rights of women. In the United States, suffragettes campaigned at the individual state level for political power. At the same time in China, feminist scholars advocated for women's education and the abolition of foot binding. One overlooked aspect of early twentieth century women in the political sphere is their role in international politics. Both the United States and China demonstrated gains for women in the international political sphere. One great example of such interaction is between American painter Katharine Carl and Empress Dowager Cixi of China. In 1903, Katharine Carl travelled to the Forbidden City of China to spend nine months with Empress Dowager Cixi. The innermost courts of China were previously off limits to any foreigners, but due to an abundance of international pressure, Dowager Cixi opened the courts to save China's declining reputation. Upon her arrival to China, Katharine was tasked by the United States government to paint a portrait of the Dowager for the 1904 Louisiana Purchase Exposition in St. Louis, Missouri. Their interactions are best analyzed through a variety of primary and secondary sources. In particular, Katharine Carl wrote a novel titled *With the Empress Dowager* that offers immense insight into her experiences. Those written sources, combined with Carl's artistic works, offer a rich opportunity to analyze the two women through an international political and feminist lens. Through their interactions, both women rose against the traditional roles for their gender at the time to foster international connections for the benefit of their own country. In addition, the interaction between the two women highlights the complex international power dynamics of the very early twentieth century as America's influence increased and China's declined.

# Languages, Literatures, Cultures & Writing



## **The APSCUF Presidents – An Oral History Project**

Kristen Craycraft, Aodhan Ridenour, Sarah Heary, and Greta Walk

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### **Exhibit**

#### **ABSTRACT:**

While the various editions of the Collective Bargaining Agreement tell the story of the PASSHE system and APSCUF, those documents are 1) not easy reading 2) not local to the Slippery Rock community. “The APSCUF Presidents: An Oral History Project”—a project funded by a Faculty-Student Research Grant--seeks to preserve our campus’s important labor history by interviewing the living APSCUF presidents and interweaving their commentary into an engaging, narrative, book-like document, one created by students that can be distributed at SRU’s new faculty orientation and at scholarly conferences. The project’s culminating book is being arranged by a range of humanities majors and will invite SRU students, community members, and external scholars to better understand, study, and celebrate the Slippery Rock community.

## **“None of Us Change Over Time”: Ann Rice and the Contravening of Gothic Tropes**

Rachel Hoarau

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**Oral**

### ABSTRACT:

The “monster,” has long been a trope in gothic fiction, featured in popular European and American novels like *The Castle of Otranto* (1764), *Frankenstein* (1818), *Dracula* (1897), *The Turn of the Screw* (1898), and *The Haunting of Hill House* (1959), among others. Though these monsters may resemble humans (speaking, imitative of traits, etc.), one constant is they are never equal to humans. The monster is *always* the Other. Traditionally, readers have been unable to read the monster as anything other than a creature threatening our collective humanity, a deeply unsettling plot point. Mary Shelley’s monster comes closest, as readers occasionally hear the creature’s anguished thoughts, but in the end, it was still merciless.

However, after centuries of this trope, Anne Rice (1941-2021) drastically redefined it. She was the first popular author to humanize the monster with her thirteen-book series *The Vampire Chronicles*. She wrote her monsters with sense of justice, and a full range of human expression—sexuality, grief, and joy, among others. She made her vampires beautiful in their preternatural state, and most importantly, she gave them back stories, histories. The series’ first novel, *Interview with the Vampire* (1976), gained a massive following in 1980s goth subculture, and consequently changed the literary genre. Her influence spread out into supernatural fiction where other authors latched onto this revision of the trope, producing successful fiction such as *Buffy the Vampire Slayer* (1997), and *The Vampire Diaries* (2009) among others, as well as spawning television and movie adaptations.

With Rice strategically adopting a first-person point-of-view and her usage of romanticism in tandem with this already-existing trope turned the monster from an unsettling stranger to a coveted fantasy figure that allowed readers to live vicariously through them. Consequently, this literary genre was forever changed.

## **A Call for Self-Reflection: Reading Disability in the Visual Art of Panteha Abareshi**

Costello Keene

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[clk1021@sru.edu](mailto:clk1021@sru.edu)

**Oral**

### **ABSTRACT:**

Art has the amazing gift to pull us together, tear us apart, open our eyes, and feel for those we barely know. Through images, sound, or movement, we may lose our prejudice, even if for only a moment. These moments are crucial in the unravelling of our assumptions, expanding our capacities for empathy.

Panteha Abareshi proposes a world of possible personal reflection and empathy for us through their critique of disability and physical presence. Abareshi was diagnosed with Sickle Cell Zero Beta Thalassemia at the age of five. This genetic disorder decreases life expectancy and deteriorates the body over time, subsequently causing chronic pain. Abareshi's experience with life and death, the body as both a tool and an obstacle, and the other various explorations of the human identity, fuels their artwork.

Using forms of installation art and movement Abareshi critically examines the expectations we impose upon our physiology. The viewer is forced to reflect on their own implicit bias, as the works deviate from the theoretical norms of those we perceive as disabled.

Using Abareshi's work as a base for analysis, *A Call for Self-Reflection: Reading Disability in the Visual Art of Panteha Abareshi* encourages us to reflect on how the physical, lived existence affects our understanding of life. The exigence for new perspectives in contributing to the representation of disabled persons provides an important context to this self-examination. It proposes one important question to the audience: how would you analyze your own body? Through an in-depth analysis into the selected works of Abareshi, this presentation demands that we explore our own bodies, taking up the challenge to further the dialogue and representation of disability in not just art, but the vast and expansive physical world.

# Mathematics & Statistics

## Is the Solar System Stable?

Aran Bybee

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**Oral**

### ABSTRACT:

In 1885, King Oscar II of Sweden announced a challenge consisting of four mathematical problems, one of which asked whether the solar system would continue its clock-like motion, or would it stray from that, to either fly off into the void or crash into the Sun. The selected winner for this problem, Henri Poincaré, showed that even for a 3-body system, the orbits could behave so chaotically that it would be impossible to predict their long-term futures. This work laid the seeds for what would become the branch of mathematics known as chaos theory, in which the ideas of stability, instability, and chaos became formalized. This talk aims to explain some of the background knowledge needed in order to determine whether a system is stable or is chaotic, and how that can be applied to celestial bodies such as Pluto.

## Fibonacci Groups and the Finiteness Problem

Nathanael Lozito

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### Oral

We use computational methods to explore the finiteness problem for the groups of Fibonacci type. These groups depend on integer parameters  $n$ ,  $m$  and  $k$  and have been used historically to investigate certain algebraic properties which are known to be algorithmically undecidable. Here we search for finite groups of Fibonacci type and automate this process by nesting computational loops, iterating the parameters to explore the order of the groups and the termination time of the algorithms. Using our method paired with current technology we are able to recover a large number of results from the literature.

# Music

## **SRU Symphonic Wind Ensemble Library Diversification**

Benjamin Johnston and Ian Phelps

Faculty Sponsor: Dr. Jonathan Helmick

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### **Poster**

#### **ABSTRACT:**

In alignment with Slippery Rock University's commitment to equity for racial, ethnic, gender, and sexual identities, the SRU Symphonic Wind Ensemble engaged in equitable programming practices in the wind ensemble library. The Symphonic Wind Ensemble explored options to decrease the disparity between overrepresented and underrepresented composers in the wind band library. One way to decrease this disparity was by commissioning a unique, new musical work from the pen of an underrepresented composer. The SRU Symphonic Wind Ensemble identified a composer from an underrepresented background, and worked with them to create a musical composition, which became a permanent part of the SRU Symphonic Wind Ensemble Library, and help to decrease the global disparity between works by overrepresented and underrepresented composers



**Nonprofit**  
**Management,**  
**Empowerment and**  
**Diversity Studies**

## Wolf Creek Fieldwork

Alana Colvin, Zachary Coletti, and Brock Esenwein

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### Poster

#### ABSTRACT:

This project examines material found at the Wolf Creek/Miller Woods archaeological site excavated by SRU students and faculty from 2019-2022. Our research analyzed recovered artifacts to help understand Indigenous activities in the area, before and after European contact. A collection of both historic and prehistoric artifacts was found at the site. Historic artifacts include an 1865 U.S. penny, several hand-cut and square iron nails, and a significant amount of broken glass. This indicates the presence of European settlers beginning in the 19<sup>th</sup> century. Below the historical material is evidence for the history of Indigenous land use: lithics, charcoal, and fire-cracked rock. Analysis of these artifacts allow us to address three primary topics of interest: (i) the chronology of site occupation and use, (ii) specific activities at the site, and (iii) the spatial distribution of the site. Radiocarbon dating of charcoal from one archaeological feature, a presumed hearth (fire pit), yielded an age of 1650 +/- 30 C.E, placing the feature a few decades prior to the first documentation of white settlers in western Pennsylvania. This piece of information has been crucial to our understanding of how the area was used. From these results, we were able to confirm the hearth was a piece of Indigenous technology. Its position in space and time suggests the area was used as a gathering and resting place for Native Americans passing through the region, connecting with the historical *Venango Trail*. By using information, we have obtained, we can share with the local Slippery Rock community the role our area played in a period of Native American history.

## **The Winter Warrior: What's a Kid To Do?**

Lajada Myers

Faculty Sponsor: Ms. Susan Bowser

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### **Poster**

#### **ABSTRACT:**

According to recent US Census data (2022) children in poverty are only half as likely than those who are not to be involved in extracurricular activities. Additionally, the Center for Disease Control (2022), suggests living in a community with access to safe, engaging, after school programs and activities is a protective factor against child abuse. "The Winter Warrior: What's a Kid To Do?, Winter 2023 – Spring 2024" brochure project was designed to provide Butler County families with a comprehensive list of free and low-cost winter activities. Working diligently for more than one month, student associates from the Institute for Nonprofit Leadership at SRU developed this brochure that was distributed to more than 1500 families. The construction of the brochure drew on students' research, graphic design, and social media skills and required students to engage with more than 15 nonprofit and social service community partners for distribution. The brochure was funded by the Butler County Prevention Council.

# Occupational Therapy

## **School-Based Mental Health Promotion and Prevention**

Aubree Ferek, Valerie Latessa, Alyssa Bittner, and Carlee Haser

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### **Poster**

#### **ABSTRACT:**

This Poster Presentation will highlight an occupational therapy student fieldwork experience implementing school mental health promotion and prevention programming in a rural parochial school in Western, PA. This programming addressed all grade levels provided in the school from Pre-K through 8th grade. Key aspects of the promotion and prevention approaches included emotional literacy, healthy social skills, positive character traits, social media literacy and safety, and active bystandership. Slippery Rock University second-year occupational therapy doctorate students implemented skill-based learning activities, discussions, and social stories to promote positive mental health and well-being and prevent negative mental health experiences or deficits. This fieldwork experience partnership provided an unmet service to students in private schools that are not eligible for government funding and support for school-based mental health services.

## **Investigating Factors that Impacted Success of Students from Marginalized Communities**

Elysse Rogers

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### **Poster**

#### **ABSTRACT:**

There is a lack of diversity at Slippery Rock University and in the field of occupational therapy. To better understand success of students from marginalized communities, a doctoral capstone project was conducted. A mixed methods survey was created using Qualtrics and distributed to 40 participants- students graduating in spring of 2024 and Slippery Rock University alumni. Qualitative coding was completed alongside quantitative data analysis. Results are yet to be determined from those specific data analyses. This data was used to better understand the experiences of students from marginalized communities at Slippery Rock University and to help form future programming related to diversity, equity, and inclusion. These programs will make higher education more accessible to students from marginalized communities and will increase diversity in the occupational therapy program at Slippery Rock University.

# Parks and Conservation

## Meaning Making at Croydon Creek Nature Center

Laura Fawks Lapole and Mackenzie Hale

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### Poster

#### ABSTRACT:

“Meaning Making at Croydon Creek Nature Center” is meant to bridge gaps in knowledge regarding how meaningful experiences are created at nature centers through the utilization of Croydon Creek Nature Center in Rockville, MD as a case study sample. As conservation social science stands as an unrepresented area of research, this study particularly is meant to lay said foundation and connect multiple theories of social behavior to the engagement and overall utilization of natural park resources. Methodologies were separated into two phases, with phase one focusing on physical interview procedure specifically with program participants and drop-in-visitors at Croydon Creek Nature Center, while phase two had a more generalized focus on the censusing and surveying of every adult that entered the nature center. Both phase one and phase two went through data analysis through the application of the software of data analysis tool MaxQDA and various other statistical resources. Findings will eventually be used to improve future programming at Croydon Creek Nature Center to increase participation engagement of nature resources and provide more insight into the need for allocation of resources most often utilized and engaged with.



# Physical Health & Education

## Bench Press: Maximal Strength- vs. Velocity-Based Training with High Resistance

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### Poster

#### ABSTRACT:

**PURPOSE:** Maximal strength training is essential in competitive powerlifting and fitness training. In recent years, velocity-based training (VBT) with 75-85% of 1RM resistance has been popularized in powerlifting preparations. Loturco (2020) revealed that 80% of 1RM should be considered the highest meaningful resistance for VBT in bench press (BP). However, no study investigated the effect of VBT with this relatively high resistance on the actual 1RM BP performance.

**METHODS:** A six-week, three workouts per week program was administered to 52 young, physically active adults (age: 22.4±5.1; 12 female). Most participants (84.6%) had prior experience in bench pressing. They were randomized into two groups of similar male-female ratios with different training concentrations: muscular strength (MS) or muscular power (MP). Pre- and post-tests were conducted on one-repetition maximum BP (1RM) and four-repetition maximal effort dynamic BP for peak concentric velocity with 80% 1RM resistance (4RV). The 4RV post-test protocols included both the “original” pre-test 80% 1RM resistance (4RVO) and the “new” 80% of the post-test 1RM (4RVN).

**RESULTS:** Paired-samples t-tests indicated significant within-group improvements in 1RM and 4RVO in both groups ( $p < 0.05$ ). The MS group improved in 1RM from 191.9±84.1 to 206.1±82.4 lbs. and in 4RVO from 0.560±0.100 to 0.651±0.135 m/sec. The MP group improved in 1RM from 198.2±66.8 to 214.4±66.1 lbs., and in 4RVO from 0.571±0.120 m/sec to 0.652±0.157 m/sec.

**CONCLUSION:** Each training program had a different focus (MS or MP) but had comparable results in developing both 1RM and 4RV. This may be related to the transfer principle that seems to be strong between maximal strength and muscular power. Additionally, improved muscular power manifested similar barbell velocities with the new 80% 1RM during the post-test compared with the velocities produced with the original 80% of 1RM during pre-testing.

# Physical Therapy

## The Role of Tooth Germs in Jaw Osteogenesis in Primates

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### Poster

#### ABSTRACT:

Rodent based studies show that cells of the dental follicle, a cellular and loosely fibrous layer encapsulating a developing tooth, contain cells that express osteoblast differentiation markers and ultimately migrate to sites of alveolar bone. Whether these processes occur in primates is unstudied. These data could offer insight into atypical developmental processes of dentition, such as agenesis (failure to form) of individual teeth. Here, we studied histologically sectioned fetal and perinatal primates (n=12) that died in captivity of natural causes. We examined the tooth germs and described the degree of cellularity of the follicular lining as densely cellular (multiple layers of cells within the follicular lining) or sparsely cellular (fewer scattered cells). Next, an immunohistochemical study of selected specimens tested whether follicular cells express runx2 and/or osterix, markers of early and late differentiation in osteoblast precursors. In one fetal howler monkey we three-dimensionally reconstructed the location of runx2- and osterix-reactive cells in relation to maxillary tooth germs. Only tooth germs just prior to or just beginning crown mineralization have densely cellular follicles. In late fetuses and neonates, cells within and peripheral to the follicle vary in diameter and shape (ranging from small, spindle shaped to large oval shaped cells). Preliminary results indicate that some follicular or perifollicular cells express runx2 or osterix, as do fully differentiated osteoblasts observed lining alveolar bone. Three-dimensional reconstruction of the fetal howler monkey reveals that putative osteoprogenitor cells, reactive to runx2 and OSX antibodies, are observed surrounding the posterior aspect of the tooth germ of the last deciduous premolar. In this region, the tooth is not yet surrounded by bone. We speculate that reactive follicular and perifollicular cells are osteoblast precursors, implying that the follicles of developing deciduous and successional teeth play a role in alveolar bone formation in primates, as demonstrated experimentally in mice.

## Diversity of Skin Tone Representation in Textbooks Used in DPT Courses

Victoria Hudson and Brandon Yeropoli

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### Poster

#### ABSTRACT:

**Background:** Textbooks are a fundamental educational resource for students in higher education, and essential to Doctor of Physical Therapy (DPT) programs. Skin tone is one feature of humans that varies greatly amongst populations and can influence how some pathologies present.

**Purpose:** The purpose of this study is to examine images in textbooks utilized in the first year of study in the DPT program at Slippery Rock University (SRU) and quantify the diversity of tone in depictions of human skin.

**Methods:** Textbooks were obtained based on a “required” designation in syllabi of courses offered in the first year of study in SRU’s DPT program. Each textbook was examined independently by two student researchers. Color images depicting human skin were rated using the New Immigrant Survey Skin Color Scale. Compared ratings and discrepancies were resolved by consensus on joint review. A faculty researcher was consulted for a final rating. Images were categorized as: light, medium, or dark.

**Results:** Thirteen textbooks were reviewed of which seven included images depicting human skin. A total of 3,828 images were rated. Of these, over 80% were categorized as “light” and less than 3% were categorized as “dark.” A drastically higher representation of light skin tone was consistent across the four publishers of these textbooks. The representation of “dark” skin tones was scant across publishers with Cengage Learning the highest, followed by Wolters Kluwer, FA Davis, then Elsevier.

**Conclusion:** Skin tone representation in DPT textbooks is biased towards lighter skin tones. It is important to promote inclusivity in the classroom and selecting teaching materials. To be a competent clinician, it is important to be aware of how certain conditions may present in patients with any skin tone.

# Physics & Engineering

## Slippery Rock School District Historical Landmark Project

Braden Astolos, Jack Armstrong, Matthew Von Kaenal, Richard Chase, and Devin Velez

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### Oral

#### ABSTRACT:

The Slippery Rock School District Historical Landmark, affectionately known as the Rocket Barn, dates back to the 1930s and was acquired from its original owners, John and Estella Mcnees. Adorned with the iconic "This is Rocket Territory" slogan, it holds immense sentimental value within the community.

However, time has eroded the landmark's structural integrity, necessitating urgent action for its preservation. A dedicated board of community members and school staff was assembled to tackle this challenge.

The project had two main objectives: first, devise a comprehensive repair plan to restore the structure, and second, explore potential future uses for the Rocket Barn. Understanding the importance of stabilizing the building, the board focused on structural repairs before considering its future role. Leveraging advanced design software like Revit, RISA, and AutoCAD, the team developed six proposals—three for repairs and three for future usage—which were refined based on feedback from stakeholders and presented for evaluation.

Ultimately, the board prioritized immediate structural concerns. Roof, rock retaining wall, and beam/column repairs were identified as crucial steps to ensure the landmark's longevity.

In summary, the diligent efforts of the Slippery Rock School District Historical Landmark board exemplify a deep commitment to preserving community heritage. Prioritizing critical repairs ensures the Rocket Barn's endurance as a cherished icon. This proactive approach not only safeguards the landmark for future generations but also underscores its enduring significance as a symbol of community pride. Looking ahead, as structural integrity is restored, exploring potential future uses will further enrich its legacy within the district, resonating for years to come.

## **Campus Expansion Project: New Health Science Facility**

Joseph Beil, Aaron Jones, Christian Torres, and Karah Donahey

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### **Oral**

#### **ABSTRACT:**

As healthcare occupations continue to be in high demand, it is essential for medical, health, and science undergraduate and graduate programs in our area to effectively accommodate future growth. The purpose and objective of this project encompass the civil aspects of designing and creating a new facility from inception to completion.

The architectural and civil designs were meticulously crafted following the engineering design process, ensuring seamless integration of the client's requirements and specifications while adhering to international and local building codes. The established design transitioned from conceptualization to manual drafting to 2D AutoCAD formats and subsequently to 3D software platforms like RISA and Revit, streamlining the creation of models and facilitating computations for structural design loads.

The floorplan of the Health Science building was thoughtfully designed, comprising 30,000 square feet to encompass the requisite classrooms, labs, lecture halls, and faculty suites while also anticipating the future needs of health and science programs. Emphasizing an optimal location on the East side of the campus, the facility's orientation considers the full sun path and its adjacency to Slippery Rock's nature reserve.

The project's vision also exploits the location by incorporating a new 150-space parking lot and landscaping to support the full-time faculty, student commuter parking, vegetation, and stormwater control, enhancing the overall campus environment. The envisioned Health Science Facility promises expanded opportunities for students to engage in instruction and hands-on learning, leveraging the latest technological advancements in the field.



## Observing Distant Black Holes with JWST

Jaden Boyle and Morgan Franos

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### Poster

#### ABSTRACT:

The farther away that scientists can visualize, the more the history of our universe can be depicted. The James Webb Space Telescope, recently launched in 2021, gives scientists enhanced capability to view distant objects such as black holes and stars by detection of infrared light. This is crucial due to the redshift that occurs as wavelengths travel towards us which would make such distant objects undetectable by the former best telescopes including NASA's Hubble Space Telescope and Chandra alone. We are studying the data collected from the JWST to solve the mysteries of the distant black holes. The JWST data is revealing that the early supermassive black holes (SMBH) have mass far smaller than the SMBH of now. Our project is to determine if this is indeed true for most of them.

## **Recycle and Reuse Technology for Polymeric Materials in 3D Printing**

Cameron Constantine

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### **Oral**

#### **ABSTRACT:**

This study explores an innovative approach to creating sustainable 3D printing polymeric materials by implementing a recycling and reuse program. The research focuses on utilizing a custom shredder to process failed Polylactic Acid (PLA) 3D prints and discarded water bottles, subsequently transforming them through an extrusion machine into a high-quality filament spool. A key aspect of this initiative involves encouraging active participation from students and faculty, who can contribute by donating empty plastic water bottles for recycling. In return, participants receive a complimentary 3D print, fostering a sense of community engagement.

The primary objective of this research is to produce the finest quality filament through the recycling process, comparing it against commercially available off-the-shelf filament. The study aims to evaluate the mechanical, aesthetic, and print quality properties of the recycled filament, assessing its viability for use in 3D printing applications. By conducting rigorous quality assessments and stress tests, the research aims to establish the effectiveness of recycling and reuse technology in creating a sustainable practice within the university setting.

The methodology involves the collection of failed PLA 3D prints and used water bottles, which are then subjected to shredding and extrusion processes. The resulting filament is thoroughly examined, measured, and compared with standard commercially available filament to ascertain its quality and performance characteristics. The study also investigates the environmental impact of the proposed recycling method, considering factors such as energy consumption and waste reduction.

Ultimately, the study seeks to contribute to the establishment of a sustainable 3D printing ecosystem within the university by promoting recycling, reuse, and community involvement. Through this initiative, the goal is to inspire a shift towards environmentally conscious practices in additive manufacturing, fostering a culture of responsibility and innovation.

## Early Universe Discoveries with JWST

Ben Crocker and Samantha Grazioli

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### Poster

#### ABSTRACT:

The James Webb Space Telescope (JWST) is an infrared telescope, launched in 2021, capable of looking back to observe some of the earliest galaxies. Cosmological redshift causes the wavelengths of light to be stretched out as they travel through expanding space causing them to be detected at infrared wavelengths. Unlike the Hubble Space Telescope which mainly observes in the visible with a narrow range in infrared, James Webb was designed to detect a significant portion of the infrared spectrum. In this project, we will review the motivation behind the construction of JWST, current data from JWST, and examine the galaxies observed that formed 400 to 700 million years after the Big Bang. With the JWST, scientists will be able to look back to when light first began to move freely, due to hydrogen reionization. This is a time when the first galaxies and stars were just forming, nearly 13 billion years ago. Some of the first galaxies captured by JWST share properties with galaxies much closer to Earth that have been studied in detail. Our objective is to discover how the early galaxies and stars were different and similar to those that we see nearby.

## Experimental Study on Erosion of Opposing Bank at the Confluence of a Culvert and a Channel

Karah Donahey and Christian Torres

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### Poster

#### ABSTRACT:

This research provides an analysis of the erosion of channel banks opposing a point flow. The confluence of channels is common in hydraulic facilities; however, little research exists on quantifying the erosion. In practical cases, protection of the opposite bank in front of a culvert is designed solely based on engineers' prior experience and judgment, due to the lack of a standard procedure. **Due to the lack of established guidelines**, a higher possibility of an over/underestimated design can occur. In order to study the effects of geometry and flow conditions on erosion, a stream table is utilized with scaling of the culvert and channels. To simulate the fluvial streams, a material made from recycled plastic or sandy soils is used. By running experiments with different flow rates and channel geometries, such as Froude number, angle of flow, discharge ratio, and culvert size, we can observe how the point flow of a culvert will affect the erosion of opposing banks. Data collected from these experiments will be used to develop empirical equations to quantify the erosion of channel banks for different flows and culvert geometries. The outcomes of this ongoing research will serve as guidelines for designing bank protection measures in front of culverts, in addition to providing a scaling methodology for future research endeavors related to erosion and sediment transport in the confluence of streams.

## Atomic Force Microscope

Cody Graves

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### Oral

#### ABSTRACT:

My project aims to create a functional atomic force microscope (AFM) that operates at low temperatures and functions in the vacuum of space. The goal is to make it accessible for universities and personal use. This AFM will allow us to analyze electron backflow and study microscopic samples like graphene.

Currently, we're building the AFM from scratch. We're prototyping the base design using a 3D printer, then transitioning to a final version made from brass alloy. The electronics are designed for full autonomy. Initially, we hand-built the circuits, but now we're condensing them into a single circuit board with a Raspberry Pi to run the code.

Right now, the circuit board is being designed and tested. The AFM can approach a sample and provide feedback from the cantilever tip. We plan to further condense the AFM, adding a few more subcircuits to the main circuit board. Once tested and proven, we'll shrink the final circuit board into a singular chip or microcircuit using lithography. This will create a compact, easily usable AFM without requiring large setups or extra equipment.

## Low-Cost Coherent Control of NV Center Qubits in Diamond

Joseph Lydon

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**Oral**

### ABSTRACT:

We present our work on a NV center qubit capable of manipulating the electron spin at room temperature. The setup is based on Nitrogen Vacancy (NV) center in diamond. The negatively charged state of NV center in diamond consists of a nitrogen atom replacing the carbon atom next to a vacancy with spin state of 1. When irradiated by a 532 nm laser, the fluorescence of NV center is at 637 nm. The intensity of fluorescence depends on the spin state of the NV center before irradiation. The spin state of the NV center depends on the local magnetic field. By using a proper sequence of nanosecond microwave pulses and measuring the fluorescence intensity, a highly sensitive NV center qubit can be built. We report our progress and design of the NV center qubit, as well as its efficiency in room temperature setting.

This material is based upon work supported by the National Aeronautics and Space Administration (NASA) under Grant Nos. NNX15AK06H and 80NSSC20M0097 issued through the PA Space Grant Consortium.

## Macoskey Center Classroom Addition Design Project

Amber Scott, Brooke Lively, Daniel Froust, and Ethan McDeavitt

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### Oral

#### ABSTRACT:

BEDA Engineering, a group of senior civil engineering students from Slippery Rock University, embarked on a project to expand the Harmony House within the Macoskey Center. With the help of Dr. Robabeh Jazaei, the goal was to create more classroom space, while supporting the center's mission of promoting a just and sustainable future. The project involved developing three layout options, conducting site investigations, managing stormwater, and ensuring structural integrity while prioritizing sustainability. By integrating these principles, BEDA Engineering exemplifies how engineering can contribute to sustainable infrastructure, highlighting the power of collaboration and innovation in achieving shared societal goals.

After consultation with the client, Samantha Bortz selected the modified Option one layout plan, which was further refined to include access to the roof, a spacious first floor with ample seating, and a functional basement. This 2000 ft<sup>2</sup> structure was meticulously designed to comply with ADA regulations and meet all relevant building codes, boasting both architectural superiority and aesthetic appeal, rendering it an attractive candidate for a grant proposal. Using software like AutoCAD, RISA 3D, REVIT 3D, etc. a structural design was composed for visual representations and testing.

Additionally, recognizing the importance of accommodating diverse research needs within the Macoskey Center's mission, the team also undertook the task of designing a specialized lab space for Dr. Amber Eade and her honeybee research. This endeavor led to the selection of a medium-sized design, situated conveniently adjacent to the beehive locations, while ensuring adherence to ADA requirements and providing ample space for Dr. Eade's research activities. This project shows innovation, collaboration, and commitment to sustainability, underscoring the pivotal role of engineering in shaping sustainable infrastructure for learning and research excellence.

## **Enhancing STEAM Education in Rural Pennsylvania: The KiP Educational Classroom and Makerspace Project**

Amina Tandukar

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### **Poster**

#### **ABSTRACT:**

The KiP Educational Classroom and Makerspace Project presents a \$200,000 expansion initiative aimed at addressing the limited STEAM (Science, Technology, Engineering, Arts, and Mathematics) education opportunities for children in rural western Pennsylvania. This expansion encompasses a 1,920 sq. ft. space with a basement, meticulously outfitted to host weekly Tech Tinkering and STEAM classes. Equipped with state-of-the-art facilities including 3-D printers and robotics, the project seeks to address the pressing need for STEAM programs in the region. Objectives of the KiP project extend beyond infrastructure enhancement; it endeavors to cultivate a natural learning environment, establish a central hub for STEAM activities, support teachers in integrating growth mindset principles and educational technologies into their teaching practices, and provide children with exposure to diverse career paths. Additionally, KiP aims to align with Pennsylvania's newly established STEAM standards, cater to group visits, classes, and camps, ensuring accessibility for all children, and foster crucial partnerships with universities and local organizations. Future plans involve expanding its scope to incorporate high school programs and additional community engagement initiatives, thus solidifying KiP's role as a catalyst for both STEAM education and community development in the region.

The engineering design team in the civil engineering program conducted extensive research to develop the project plan for the KiP Educational Classroom and Makerspace Project. Utilizing tools such as AutoCAD, 3D Modeling, and RISA software, the team created technical design layouts for both the basement and first floor of the additional building. These tools enabled the team to visualize and analyze various design options, ensuring optimal utilization of space and adherence to structural requirements. Through iterative design processes and collaboration, the team developed comprehensive technical layouts that formed the foundation for the project implementation.



## The Influence of Synthetic and Steel Fibers on Concrete's Mechanical Characteristics

Amina Tandukar, Brayden Underwood, and Amber Maurer

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### Poster

#### ABSTRACT:

The research investigates Ultra-High-Performance Concrete (UHPC), a modern concrete composition that integrates synthetic and steel fibers alongside other unconventional materials to enhance its mechanical attributes. Notably, UHPC incorporates a reduced water-to-cement ratio during mixing to mitigate porosity, coupled with distinct mixing and curing procedures distinguishing it from conventional concretes. In addition to bolstered mechanical properties, UHPC showcases augmented workability, early strength, impermeability, and durability under adverse weather conditions, marking a significant potential impact on the construction sector.

The study conducted impact tests on specimens reinforced with Polypropylene/Polyethylene and Polypropylene fibers, alongside Cold-drawn shaved steel fibers, employing a water-to-cement ratio of 0.4. Comparative analysis with control samples and samples containing Carbon Nanotubes (CNTs) revealed that Polypropylene/Polyethylene and Polypropylene fibers exhibited energy absorption rates 8% and 5% higher, respectively, than CNT-reinforced specimens. Furthermore, the failure mechanisms varied between fiber-reinforced and CNT-reinforced specimens.

## **Brown Dwarfs**

Madison Warner and Alexia Piel

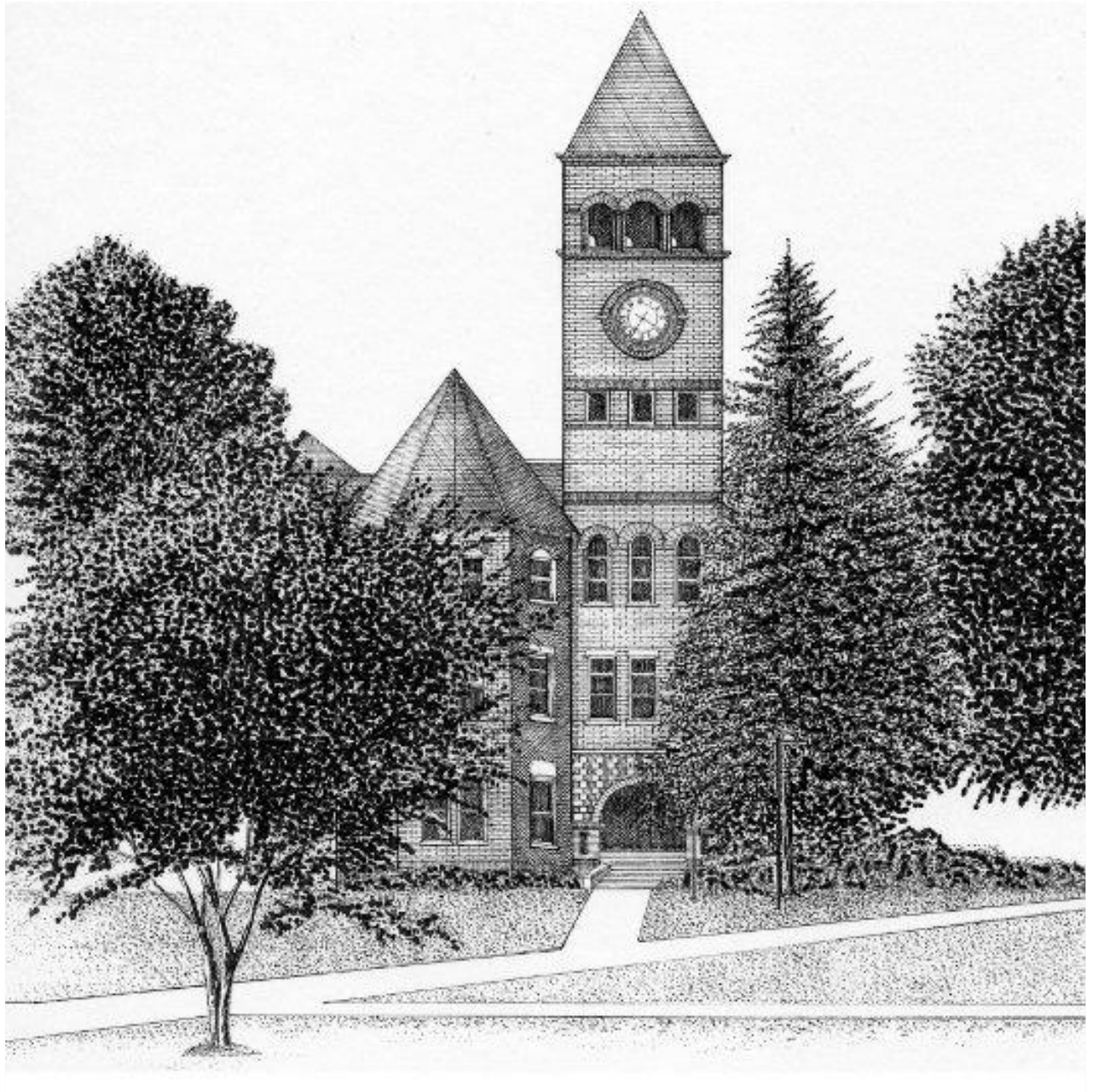
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### **Poster**

#### **ABSTRACT:**

Brown Dwarfs are celestial objects that are in between the mass of a planet and a star; in many cases they are described as a failed star due to never reaching a high enough core temperature to form. Studying and understanding these objects are imperative to astronomy because they help us understand the formation of both planets and stars due to having characteristics of both. Brown Dwarfs may be classified as one of three different types: L, T, and Y, L being the youngest and hottest of the Dwarf classification and Y being the coolest. As important as Brown Dwarfs are, they can be difficult to detect because of their low temperatures. As a result, scientists have used infrared telescopes like the recently deployed James Webb Space Telescope (JWST) to detect brown dwarfs. In our research project, we will study data from JWST and other telescopes, to determine the range of masses that brown dwarfs can possess and what implications it has for both planetary and star formation.



# Psychology

## **The Association Between Psychological Strain and Depression in Collegiate Student Athletes**

Isabella Bartoletti and Rebecca Martin

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### **Poster**

#### **ABSTRACT:**

The life of a collegiate athlete is filled with many challenges including balancing homework, practice times, lifting sessions, and lectures. An inability to cope with the pressures of being a student athlete can lead to mental health problems including anxiety, depression, and psychological strain. The purpose of this study was to determine if there was an association between depression symptoms and psychological strain among student-athletes using the Healthy Minds Dataset, a national web-based survey of college students in the US from 2021-2022. The current study included 68 people who completed the student athlete portion of the HMN survey and the Patient Health Questionnaire (PHQ-9). The PHQ-9 is a standardized screening measure for depression. Psychological strain was assessed by creating a score that included mental health strain, self-regulation, coping, and performance. A Pearson product-moment correlation test showed a positive association between psychological strain and depression in college student athletes. Understanding the relationship between psychological strain and depression brings awareness to the mental health challenges faced by student athletes. These findings can be used to assist colleges in better supporting the mental health of student athletes.

## **Sign Tracking in Female Japanese Quail (*Coturnix japonica*)**

Katelyn Evans, Hannah Cruz, Paige Mitsko, and Alyssa Toscano

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### **Poster**

#### **ABSTRACT:**

Research has shown that in a month, 13% of Americans over the age of 12 years old have engaged in illicit drug use (Centers for Disease Control and Prevention, 2022). Addiction is an issue that affects many teenagers and adults, so it is imperative to study patterns of drug use that can lead to addiction. Sign Tracking is the process of orienting towards the reward-paired stimulus rather than the reward itself. Sign Tracking has been shown to predict drug taking and relapse-like behaviors in an animal model. Understanding these behaviors may lead to behavioral or pharmacological treatments of drug addiction. The current study examined if female quail engage in Sign Tracking behavior as defined by orienting themselves towards the paired light (light paired with reward) when the light is on, opposed to orienting to the food (goal directed behavior). Five female birds were given 20 trials of a light paired with reward, every day for 5 days for a total of 100 trials. Orientation was measured as beak to light when the light was on. Sign tracking was defined as orientation to the paired light versus the place of reward delivery (i.e., hopper) when the light was on. Our hypothesis was that the quail would orient themselves toward the paired light more than the hopper which indicates that they are engaging in Sign Tracking rather than goal directed behavior. Results found that the quail did Sign-Track more than engage in goal directed behavior.

## The Association Between Sleep Patterns and Self-Esteem

Erin Glasier

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### Poster

#### ABSTRACT:

Research shows that there is a bidirectional association between sleep quality and intrapersonal adjustment (Tavernier & Willoughby, 2014). A better friendship quality significantly predicted better sleep quality over time, and a unidirectional association between sleep quality and academic achievement. Sleep has been shown to be important in external and internalizing problems (which includes self-esteem) specifically in the 12-13 age group (Vazsonyi, Liu, Javakhishvili, Beier, & Blatny, 2021). The longitudinal study was completed with Czech adolescents and began with 586 participants. The dependent variables included academic competence, internalizing problems, and externalizing problems. The results showed how important sleep is for external and internalizing problems during that time of growth, although none of the sleep patterns predicted academic competence. A similar study was conducted with college students in Vietnam but focused on social comparison on social media. Researchers examined whether the adverse link between passive social network usage (PSNU) and life satisfaction was mediated by both envy and self-esteem focusing on social comparison. 155 men and 435 women were surveyed (Nguyen & Cheng, 2022). The findings were that users' social network use may negatively impact their general life satisfaction due to their engagement in social media. Women were found to be more negatively impacted, envying who they saw on screen. This can suggest a lower self-esteem.

## Associations Among Photographic Social Media and Body Image

Jacob Harvey

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### Poster

#### ABSTRACT:

With the rise of photographic social media in today's culture, body image is an increasingly important topic when considering its mental impact on those who engage with this media. Research has shown that consumers of media, especially adolescents, are prone to have lower self-concepts and subjective well-being (Torres & Brito, 2022). The present study is intended to examine relations between this photographic content and perceived body image, which has multidimensional impacts on a person. The participants are students from introductory-level psychology classes at Slippery Rock University. An online survey was created through Qualtrics and distributed to volunteer participants from these courses. Our sample ( $N=221$ ) included self-identifying men ( $n=95$ ) and self-identifying women ( $n=126$ ) who completed this anonymous survey that assessed levels of body shame, body surveillance, self-esteem, social media consciousness, and overall depression. The results suggest that overall social media usage was associated with overall self-esteem, body image concerns, and depression; gender differences were also found and will be presented. Discussion will include how social media may influence body image and depressive symptoms and perpetuate societal beliefs of women's bodies. Further research is required to consider how social media might be used as a positive influence in one's self-image as well.



## **Anxiety and Body Image are Associated with Weight Concerns in College Students**

Tatiana Henry

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### **Poster**

#### **ABSTRACT:**

Throughout the world, rates of mental illness are rising at a concerning rate. As anxiety and body image issues increase, so does the rate of eating disorders and mental illness. Data from the 2020-2021 Healthy Minds Study (HMS) was collected from undergraduate students across the United States. The data from the HMS was analyzed to understand what variables predict a participant's score on the Weight Concern Scale (WCS), a test that can be used to help in the diagnosis of eating disorders in college students. An eating disorder is characterized by negative changes in thoughts or behaviors related to or involving eating. Standard linear regression was used to assess the degree to which anxiety (Total on the GAD-7), sex (male/female), frequency of weighing oneself (daily, weekly, monthly, less than monthly), and concerns about being treated fairly because of weight (disagree/agree) predicts weight concerns (total on the Weight Concerns Scale) in college students. Analyses were conducted to ensure no violation of assumptions for normality, linearity, multicollinearity, and homoscedasticity. The total variance explained by the model as a whole was 32%,  $F(4, 1524) = 179.26, p < .001$ . In the final model, anxiety ( $\beta = .16, p < .001$ ), sex ( $\beta = -.16, p < .001$ ), frequency of weighing oneself ( $\beta = .33, p < .001$ ), and concerns about being treated fairly ( $\beta = .32, p < .001$ ) were unique, independent predictors of weight concerns. The association between anxiety, frequency of weighing oneself, and concerns about being treated fairly because of weight are all predictors of weight concern. Further research is needed for the data to be applied to more populations so that clinicians can address multiple factors in someone's life that may contribute to the development of an eating disorder.

## The Association Between Smoking and Anxiety in College Students

Ruth Hughes

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### Poster

#### ABSTRACT:

Many factors can impact the presence of anxiety in college students, especially with new changes in lifestyle and social behaviors. This anxiety may possibly lead to unhealthy coping behaviors, such as substance use. The purpose of this study was to determine if there is an association between the severity of anxiety and smoking cigarettes in college students. This study used data from the Healthy Minds Network Dataset which was a national web-based survey of college students in the US spanning from 2021- 2022. The total number of college students who participated was 95,100. Students were asked about their clinical anxiety using the Generalized Anxiety Disorder screening (GAD 7) questionnaire. Of the total number of participants, 77,101 completed the GAD-7. Total scores on the GAD-7 range between 0-21. Scores of 5, 10, and 15 are cut-off points for mild, moderate, and severe anxiety, respectively. GAD-7 total scores greater than 10 have a sensitivity of 89% and a specificity of 82% for generalized anxiety disorder. Participants' smoking habits were assessed based on whether participants reported smoking within the past 30 days (yes/no). Results showed that there was a significant association between smoking and anxiety scores in college students. Overall, 34% of college students scored 10 or higher on the GAD 7, indicating severe anxiety. While many factors can influence anxiety in college students, smoking appears to be a significant factor. Smoking cigarettes may be a coping strategy used to manage anxiety. With this knowledge, colleges should use this as a warning sign that smoking can be used to indicate that a student is experiencing anxiety.

## **Previous History of Physical Abuse is Associated with Suicidal Ideation in College Students**

Isaac Myers and Philip Lehman

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### **Poster**

#### **ABSTRACT:**

Suicide is an unfortunate result of various possible culminating life circumstances and can be due to ongoing depression, specific tragedies, or a tragic event in a student's life. Suicide is preceded by an increase in suicidal ideation. Suicidal ideation is defined as any serious thoughts of attempting suicide. In addition, experiences of physical abuse before the age of 18 are associated with suicide. The purpose of this study was to determine whether there was an association between previous physical abuse and suicide ideation in college students. A secondary data analysis was conducted using the 2021-2022 Healthy Minds Dataset. The Healthy Minds Dataset is a web-based survey of college students from across the United States. There was a total of 85,225 participants who answered survey questions about life-time physical abuse and suicidal ideation. The following question was used to assess experiences with physical abuse: "In your lifetime, how many times has anyone struck or injured you?" (yes/no). Suicidal ideation was a dichotomized variable (yes/no) that asked whether participants had thought about suicide in the past year. A Chi Square Test of Independence showed a significant association between physical abuse and suicidal ideation. Results showed among college students who reported thinking about suicide, 20.8% have been physically abused compared to 9.4% who had not. A major strength of this project is the use of a national, population-based survey that represents college students across the United States. While this study is not able to determine when physical abuse occurred, it does indicate that past physical abuse is important to consider in relation to suicidal thoughts in college students.

## The Association Between Insomnia and Academic Performance in College Students

Alexandria Roddy

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### Poster

#### ABSTRACT:

Adequate sleep enhances attention, insight, decision-making, speech, learning, and memory, which are all key aspects of a student's academic performance (Seun-Fadipe & Mosaku, 2017). Many university students exhibit sleep problems that impact their academic performance (Hayley et al., 2017). The purpose of this study was to examine the relationship between insomnia and academic performance and to better understand this relationship to allow college students to achieve higher academic performance. The data for this research came from 95,860 university students in the Healthy Minds Study. The focus of the study was on the 747 students who participated in the modules for sleep and academic performance. Insomnia was measured using the total score on the Insomnia Severity Index (ISI) which assesses a person's level of insomnia with seven questions about sleep patterns and their impact on quality of life. A categorical variable was created by using a score of 15 or greater as a threshold for the presence or absence of insomnia. Academic performance was measured by combining four academic performance variables and is defined as the total score of the student and their professor's belief in the student's academic success, and the number of hours the student spends studying and attending class each week. Higher scores demonstrate better academic performance. A one-way ANOVA showed a significant association between the presence of insomnia and academic performance. The results illustrated that students with insomnia had lower academic performance compared to students with no insomnia. Understanding this association is important for college students to prevent sleep problems for better academic performance.

## **The Impact of Mindfulness Practices on Positive and Negative Moods: A Pilot Study**

Abbey Sheppard

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### **Poster**

#### **ABSTRACT:**

This study examines the impact of Shinrin-yoku (forest bathing), mindful coloring, and phone use on the perceived affect (positive and negative) of college students. Forest bathing is a practice originating in Japanese culture, in which individuals immerse themselves in nature to promote well-being. Mindful coloring is a practice that involves intentionally coloring intricate designs and patterns for stress reduction. In this study, the participants will be divided into three groups with 10 participants per group (equal gender representation). Participants will be recruited from an introductory course in Psychology with permission from the instructors. Group 1 participants will engage in forest bathing by practicing slow-relaxed movements, deep breathing, and noticing sensory experiences on the Macoskey Center grounds. Group 2 participants will engage in mindful coloring and be asked to bring awareness to the physical sensations of coloring. Group 3 participants will engage in scrolling on their cellphones. Each experimental condition will be 20 minutes in duration. Using a pre and post-test design, participants will complete a short survey (Momentary Positive Affect and Negative Affect Scale) on current mood states before and following the experimental conditions. Participants will also complete surveys to measure levels of mindfulness, rumination, depression, anxiety, and stress. To measure participant general well-being, the Five Facet Mindfulness Questionnaire, the Nature Relatedness Scale, Depression Anxiety Stress Scales, and the Rumination-Reflection Scale will be utilized. Also, current levels of self-care and demographics will be measured with surveys designed for this study. College students tend to have high rates of stress and fatigue and can benefit from the improved focus and relaxation gained through mindfulness practices. The study is currently under IRB review. Data collection and analysis will be complete by the date of the research symposium.

# Public Health

## Awareness and Perception of Lifestyle Risk Factors for Cancer among College Students at Slippery Rock University

Megan Pine, Breea Gray, and Allie Rennette

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### Poster

#### ABSTRACT:

**Background** - Cancer remains a formidable health challenge, and its impact on individuals is profound. Young adulthood represents the age of major transitions in life, a period of developing and maintaining healthy or unhealthy lifestyles. Some of these lifestyles include poor nutrition, use of tobacco/smoking, excessive alcohol consumption, use of illicit drugs, exposure to UV rays, unprotected sex which could lead to exposure to oncogenic viruses, and exposure to mental health and stress. These behaviors can predispose them to subsequent chronic diseases such as heart disease and cancer risks later in life. Despite this, there is a significant gap in awareness and understanding of lifestyle risk factors for cancer among young adults. Addressing this knowledge deficit becomes crucial in fostering healthier choices and potentially reducing the risk of cancer diagnoses later in life.

**Methods** - To assess the current level of awareness among undergraduate students at Slippery Rock University, a survey was conducted. An email was sent to all eligible students, resulting in 379 responses. The survey assessed awareness of risk factors of cancer and heart disease. Subsequently, ongoing one-hour focus groups have been initiated, each comprising four students and a moderator. The focus groups aim to delve deeper into participants' willingness and eagerness to acquire more information about cancer and its risk factors.

**Findings** - The insights gathered from the survey and focus groups will serve as a foundation for the development and implementation of multi-phased educational intervention tailored specifically for young adults to address the specific needs and interests identified during this phase of the project to increase awareness and risk perception of heart diseases and cancers using persuasive technology with the ultimate goal of reducing the incidence of cancer and heart diseases.

# Recreational Therapy



## Is Education Enough? Using Seated Yoga and Education for Falls Prevention Intervention for Older Adults

Leanne Digman, Madison Setto, and Riley Page

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### Poster

#### ABSTRACT:

In 2020, for more than 36,000 older adults the cause of death was a fall, accounting for almost 60% of unintentional injury deaths (CDC, 2020). Due to the risk of falls, older adults need preventative measures, especially non-pharmacological approaches like yoga. Limited research exists on seated yoga interventions and educational sessions for falls prevention, but a gap in research exists in the effectiveness of combining the two. Throughout the 8-week program, the experimental group participated in one 1-hour session per week with an educational component. The control group only received falls prevention education. The research team collected pre and post assessment data on the Strength and Balance tests (Timed Up and Go (a measure of mobility), 30 Second Chair Stand (a measure of lower limb strength), and 4-point Balance Tests (side-by-side, big toe, tandem, one foot). These physical assessments were accompanied by various self-report assessments. Post assessment data showed that the experimental group improved on the Timed Up and Go (TUG) by decreasing time on task (baseline  $\bar{x}$  = 19.14 follow-up  $\bar{x}$  = 16.81,  $p$  = .028) and the Chair Stand by increasing stands in 30 seconds (baseline  $\bar{x}$  = 8.15, follow-up  $\bar{x}$  = 10.92,  $p$  = .003). No significant changes baseline to post were seen for the four balance tests, but stand on one foot showed a trend toward improvement (baseline  $\bar{x}$  = .846, follow-up  $\bar{x}$  = 1.76,  $p$  = .09). When comparing the control group to the experimental group, the data shows a significant increase in the chair stand ( $p$  < .004) in experimental. The one leg balance is also trending a significant difference ( $p$  < .057) between the two groups.

# Social Work

## Supporting Veterinary Staff with Therapy Dogs

Alexandra Kaufman

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**Oral**

### ABSTRACT:

Therapy dogs are a powerful tool that can be utilized to help people in need. The unique features of working with a therapy dog seem to have positive impacts on people such as lowering stress and anxiety (Lackey et al. 2019). Professionals working in the veterinary field have experienced a decline in their well-being due to occupational stress (Volk et al. 2022). Occupational stressors in the field including grieving owners and dying patients, which likely contribute to stress and burnout. This research was conducted at two veterinary hospitals for 3 consecutive months, with participants attending a minimum of 1 session a month. These sessions consisted of participants socializing with the therapy dog(s) for at least ten minutes, however they were welcome to stay longer since each session was open for two hours. The dogs who visited were highly trained and certified HOPE animal-assisted crisis response dogs. Participants had their blood pressure and heart rate measured before and after each session. Participants were also asked to rate their stress level before and after with a scale that ranged from 1-5 (1 being “not at all stressed” and 5 being “extremely stressed”). Each participant also completed Hudnall and Stamm’s (2012) Professional Quality of Life Scale (PROQOL) at the end of each session they attended. There was a statistically significant change in systolic and diastolic blood pressure, as well as the subjective report of stress. Results of this research suggest that there is a need for more intensive and continuous interventions to be studied since the results had no measurable effect on participants’ compassion satisfaction, burnout, and secondary trauma score. However, participants ratings of the therapy dog visits were extremely positive.

## **The Effects of Pre-Intervention on Test Anxiety**

Christina Vinroe and Brieana Cassidy

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**Oral**

### **ABSTRACT:**

The presentation will cover research findings on pre-test interventions to help reduce test anxiety. Participants will learn different interventions that help reduce stress and practice these skills during the session. Small groups, role-play, and interactive activities will allow participants to practice skills and learn how to use them in their classrooms across disciplines. The presenters will use PowerPoint, handouts, and interactive activities to practice the interventions to reduce test anxiety. Participants will learn how the interventions increase ADEI across students by learning how to teach and use them in their classrooms. The various practices learned will also promote social emotional learning in students.

# Special Education

## **Special Education Pre-Service Teachers' Perceptions of School-Based Mindfulness Practices**

Jenna Jones

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**Poster**

### **ABSTRACT:**

Teachers across the world are life's untold superheroes. With burnout continuing to grow among teachers it became precedent that something had to be done. COVID-19 caused thousands of teachers to step away from the profession that they once loved. With a new generation of teachers entering the field every year it became important that these young teachers be prepared to have a long-lasting career. Allegheny Health Network recognized this problem and created the Chill Project which since its first year has continued to grow.

## **Special Educators' Perspectives and Experiences with Workplace Bullying**

Kristin Pierson-Malenky

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**Oral**

### **ABSTRACT:**

The purpose of this study was to determine K-12 special educators' perceptions and experiences with workplace bullying. Specifically, this study focused on the lived experiences of educators in PSEA's Midwestern Region. Their perceptions and experiences are presented sequentially, through key cruces that evolved through the interview process.

The participants were five special educators, in various teaching positions, at varying points in their careers. Each participant was interviewed for approximately 30 minutes via Zoom. This interview was a semi-structured format, discussing their experiences and perceptions of workplace bullying.

The intention of this research was to gather perspectives of the participants about the growing phenomenon of workplace bullying, thus lending itself to a phenomenological research design. From each question the researcher extrapolated key cruces through multicyclic coding analysis. Following the interviews, participants received an electronic copy of the transcribed interview and reviewed it for precision. This goal of this study is for participant's voices to uncover potential connections/truths to understand the phenomenon of workplace bullying. These findings may transfer to other fields also struggling with workplace bullying. The population sample is unique to my personal experience, but the overarching goal spreads further than K-12 special education departments.

The combination of cruces can be grouped into four areas for the purpose of further discussion. These provide a foundation for understanding participant's responses concerning workplace bullying. The four key areas are workplace environment and administrative applications, similarities and differences between special and general educators, experiences with workplace bullying and social structures in the workplace, and personal reflections participants shared. This study concludes that workplace bullying is occurring in all participants districts in various formats. The participants are calling for administration to assist in creating a safe, productive, and positive work environment for all building members.

# Strategic Communication and Media



## **Public Relations Case Study: How #VotingMovesCA Succeeded in Numbers & Impact**

Sarah Anderson and Emma Zeiler

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**Oral**

### **ABSTRACT:**

This paper dives into the flaws in modern-day democracy and how the League of Women Voters advocates for the importance of minority populations' votes. Through easily accessible voting education and a social media campaign dedicated to motivating young Black and LatinX voters to exercise their voting rights, LWV represents itself as a "one-stop-shop" for election information. LWV's social media campaign, #VotingMovesCA, takes a strategic approach to navigating TikTok and snapchat, leading to success amongst the young, Black and LatinX online communities and voting populations.

Throughout this research paper, we dive into the LWV's history and the organization's significance in modern-day democracy. LWV's #VotingMovesCA campaign is dissected and evaluated for its successes and areas to improve. We compare our study's primary organization to a similar solutions-oriented network, Common Cause, along with unveiling the successful tactics this organization employs. Audience research is a major section of this research paper, highlighting the bias elected officials and stigmatized standards employ on Black and LatinX populations concerning voting and electoral participation. Nearing the conclusion of this research paper, we give an analysis of the LWV #VotingMovesCA campaign's success and discuss the organization's adherence to the PRSSA Code of Ethics.

Public relations professionals can look at this research as an example of how successful campaign and audience research can lead to a campaign that succeeds in more than just numbers and engagement. This campaign shows that putting effort into an empathetic public relations campaign can pay off in different ways. Having metric success, awards, and recognition is great, but LWV, campaign influencers, and the audience felt the impact of this campaign on a deeper level. A PR campaign can be considered a success if it impacts people deeper than clicks, follows, and calls to action.

## Connecting the Campus and Community Through Storytelling

Sarah Anderson and James Cressman

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### Poster

#### ABSTRACT:

Student newspapers define themselves as forums of student expression (Fleming & Dolan, 2021). As gatekeepers of information, student journalists must have a clear understanding of the concept of traditional “newsworthiness,” in addition to the stories that are important to their specific target audience (Lewin, 1947). They must also have a strong grasp of how an audience is consuming news information and adapt accordingly. As a newspaper’s audience evolves, the content of the newspaper should reflect a similar change. The way in which information is presented to their audience is what journalists call a “news philosophy.”

The Rocket has served as the student newspaper of Slippery Rock University for a century. In the latter part of the 19th century, SRU published a school newspaper, but it was a combined student and faculty effort. From 1934 to present, The Rocket has been an independent, student-run organization, which means the student-elected editor-in-chief has the final say in all editorial decision-making.

With the support of a faculty adviser, The Rocket staff revisits and redefines The Rocket’s news philosophy under each new editor-in-chief. The purpose of this presentation is to bring more transparency to that process. Additionally, this poster presentation will explore The Rocket’s news gathering and reporting processes, and through a macro lens, what it means to be a student-run newspaper. At the conclusion of this session, audience members will feel more informed about the purpose and practices of The Rocket at Slippery Rock University.

## **A Case Study on Designing a Big Game Hunter Fitness & Nutrition-Tracking App**

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**Poster**

### **ABSTRACT:**

This case study project focused on the research, design, and prototyping of an interactive multimedia mobile app tailored to meet the distinct requirements for Apex Predator Complex, a specialized fitness center catering exclusively to big game hunters preparing for the hunting season in Montana, with a specific emphasis on developing a nutrition-tracking app aimed at catering to the dietary needs and performance optimization of big game hunters. By employing a user-centered design thinking methodology, the project encompassed various stages including user research, persona development, needs statement formulation, user journey mapping, wireframing, and prototyping. The user research involved secondary methods, with a specific emphasis on analyzing existing fitness and hunting-related mobile applications, researching dietary and nutritional trends among big game hunters, and studying the preferences and habits of this demographic to inform the creation of user personas and identify key needs. The user journey map and wireframes created visualizations of the end-to-end experience on how it facilitated the seamless integration of nutrition tracking and performance optimization, which showcases features such as effortless scheduling of training appointments, active tracking of nutrition and macros, incorporation of tailored workout routines, and effective preparation for the upcoming hunting season. The result was an interactive prototype developed in Figma to demonstrate the app's functionality and user interface design.

## **Public Relations Case Study: The First Americans Museum's Grand Opening**

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### **Poster**

#### **ABSTRACT:**

This project details the case of the Oklahoma City First Americans Museum's grand opening public relations campaign. This media relations campaign from a non-profit organization works to support Native, or First, Americans and bring them to a new museum. This project presents the case of the First Americans Museum as complementary for public relations professionals conducting a campaign with a primary audience of a specific minority.

The background of the museum and its long development are presented along with the overview of the campaign. The project examines the tactics and media outlets used by the First Americans Museum and how they represent different publics. The First Americans Museum's opening is compared to the that of the Smithsonian National Museum of African American History and Culture in Washington, D.C.

This campaign targets a wider audience than the First Americans Museum, though still through media relations. The project also examines the ethics of the First Americans Museum's practices within the campaign and provides suggestions for how the First Americans Museum and the National Museum of African American History and Culture can be improved.

## The Rise and Fall of the Rocklettes

Danielle Ferguson

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### Exhibit

#### ABSTRACT:

This research project delves into the history of the Rocklettes in the form of a captivating documentary. The Rocklettes were an all-female dance group that originated at Slippery Rock University in 1957. The project is based on primary source materials from the university archives, including personal interviews with members of the group, photographs, and archival documents.

The Rocklettes were founded by Barb Oakley Clarke and her friends in 1957. The idea for the group was born during a night of relaxation in the dorms, and the Rocklettes made their debut performance alongside the university's marching band in 1960. The group quickly gained popularity, performing at home and away games, as well as various events in the community. In 1967, the Rocklettes even made an appearance at the Steeler's halftime show, solidifying their place as a beloved performance group in the area.

The Rocklettes were an integral part of Slippery Rock University's show band, under the leadership of band director Blase Scarnati. Scarnati aspired to have a show band that was different from other marching bands, with a focus on showmanship and entertainment. The Rocklettes were a key component of that vision, with every performance featuring a new lineup of music and a new routine for the dancers.

However, by the mid to late seventies, the Rocklettes' dynamic began to shift. The university's new president, Herb Reinhardt, was obsessed with the university's image and public relations. Reinhardt brought in Cheryl Levick to oversee all women's athletics on campus and asked faculty to discuss how the weekend went after each home-field football game. During one of those meetings in the early eighties, Levick shocked the room by claiming that the Rocklettes were too suggestive and inappropriate for the university's image.

Levick's comments marked a turning point for the Rocklettes. The group slowly transitioned from a dynamic, performance-focused group to a standard drill team. The group's costumes also underwent significant changes during this time, reflecting the more liberal fashion trends of the late seventies and early eighties.

Overall, this research project sheds light on the history of the Rocklettes and their role in Slippery Rock University's show band. The project highlights the group's popularity and success, as well as the changes that occurred due to shifting cultural and institutional values. The project also underscores the importance of preserving primary source materials in archives for future research and inquiry.

## **“Glass Half Full News” by Got Milk**

Danielle Ferguson and Lana Wallace

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### **Poster**

#### **ABSTRACT:**

In 2020, milk sales witnessed a surge during the pandemic, leading the California Milk Processor Board to launch a public relations initiative called "Glass Half Full News" as part of the Got Milk? campaign. The initiative aimed to encourage milk consumption as a staple grocery item in American households and an essential source of nutrition for millennial parents and children, primarily of Hispanic heritage.

The "Glass Half Full News" campaign capitalized on relevant visuals and social media content to position milk as comfort food during the pandemic's uncertainty. The initiative aimed to highlight milk's health benefits among Hispanic consumers through positive and aspirational messaging. As a result, the Got Milk? campaign successfully leveraged the surge in milk purchase and consumption during the pandemic and positioned milk as a nostalgic and essential source of nutrients among budding families in California.

The California Milk Processor Board recognized the potency of positive and aspirational messaging during the pandemic. The campaign by Got Milk? primarily targeted Hispanic consumers, who are known to be more optimistic and aspirational than the general market consumer. Via leveraging trends and consumer insights, the California Milk Processor Board's "Glass Half Full News" campaign aimed to increase awareness of milk's nutritional benefits and generate positive attitudes towards milk to keep Californians putting milk in their shopping carts.

This report aims to deconstruct the "Glass Half Full News" public relations campaign's content and strategy thoroughly. The initiative's success will be assessed based on in-depth research backed by multicultural public relations best practices and tactics.

## **FedEx Takes Control of the Holidays: “Shipathon” integrated Marketing Communication and PR Ethics at FedEx**

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### **Poster**

#### **ABSTRACT:**

This project examines FedEx’s use of integrated marketing communication in its “Shipathon” campaign. In addition, this project assesses whether FedEx was ethical in its communication practices. This analysis uses best practices to assess the effectiveness of these communication programs and suggests ways that the company can improve. Also presented is a comparison between the campaign efforts of FedEx’s “Shipathon” and Amazon’s “The Show Must Go On.”

This in-depth research was conducted by analyzing FedEx websites – more specifically its newsroom, blogs and press releases. Publications, press materials and special virtual events were among the tactics studied. Integrated marketing communication combines advertising, public relations, marketing and promotions to create consistent and unified messaging and branding. Integrated marketing communication is one-way organizations attempt to credibly engage audiences, including media, community members, other businesses and consumer publics. Therefore, this analysis provides a timely snapshot of effective organizational communication programs.

The ethics of FedEx were evaluated using the Public Relations Society of America Code of Ethics, which emphasizes advocacy, honesty, expertise, independence, loyalty, and fairness. Throughout this campaign, it is evident that FedEx incorporates all these ethical codes into its brand marketing.

This research shows that although FedEx has a unique and diverse set of partnerships, the company could be even more effective in reaching its target audiences. Suggestions include introducing John Ratzenberg as a spokesperson and producing higher-end technology to help alleviate the demand of packages. Although the public relations and integrated marketing communication programs uphold ethical values of the profession, there are still opportunities to improve the reach to consumers to gain more brand awareness.

## **The Rebirth of North Hall**

Maxwell Graziani

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### **Exhibit**

#### **ABSTRACT:**

My research project was a research video made for Dr. Charles's class Message Prep. For the assignment, we had to pick a topic revolving around Slippery Rock University and research information and present our findings in a video we made. For my topic, I settled on the university's dorm building North Hall. My sister, who works for the campus, told me many different interesting facts about the building and a bit about its past. I chose to focus on the revitalization for North Hall following its devastating Homecoming Fire in 1937. I decided I wanted to try and adapt an almost cinematic tone to my video. I also decided to slow down the pace of my video and present the information in a cinematic way so that the audience could follow the story of North Hall's rebuild properly. I was able to find some research information online and through the SRU archives but my best source of information was Dr. Robert Watson. He provided lots of facts about the unsafe conditions that plagued North Hall and how Emma Guffy Miller helped improve the building. After gathering all the information and pictures, it was time to lay out the final video. I decided for an opening sequence, I did a series of sweeping shots to classic piano music as we hear a crash and orange light from the flames begin to glow so the audience could witness the fire first hand. From here, we go in chronological order learning about the poor conditions of North hall, the fire, and How Emma Guffy Miller helped bring the building back to life. We finish off by seeing the North Hall Dormitory today and talk about the legacy Emma Guffy Miller left behind. The video, with the help of images, an interview and narration show how the school of Slippery Rock pulled together and rebuilt North Hall after a devastating fire.



## **Public Relations Casey Study: Analysis and Recommendations Nova Nordisk “It’s Bigger Than Me”**

Virginia Meyer

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**Oral**

### **ABSTRACT:**

This project explores, assesses, and provides recommendations for Novo Nordisk’s “It’s Bigger Than Me” campaign. The detailed explanation of the company Novo Nordisk, and the implementation of the “It’s Bigger Than Me” campaign was created by researching and compiling resources owned by Novo Nordisk. The assessment of Novo Nordisk’s “It’s Bigger Than Me” campaign was created using public relations best practices, the PESO model, and the Public Relations Society of America’s code of ethics. Utilizing the assessment conducted the messaging inconsistencies between the “It’s Bigger Than Me” campaign and Novo Nordisk were explored. The project goes on to suggest ways that Novo Nordisk can extend the “It’s Bigger Than Me” campaign by using the campaign to address the changing climate of the insulin industry.

## **Who is Emma Guffey Miller?**

Cecilia Nelson and Isabella Michaels

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### **Exhibit**

#### **ABSTRACT:**

This video project is an overview of Emma Guffey Miller. Miller was a prominent figure in both United States history and the development of Slippery Rock University in the early 19th century. She is credited with accomplishments on campus such as funding the rebuild of North Hall after the 1937 fire, serving as a board of trustees member, and dedicating historically significant land to Slippery Rock University. The video also features interviews from Kelly Bailey, SRU Alumni Director and Dr. Robert Watson. Viewers will hear one of Watson's personal interactions with Miller and be taken to the land she dedicated known as the Miller Tract. While showcasing the positive contributions she has made, this mini-documentary also touches on the legend of "Emma the ghost" who many believe is still roaming the halls of North today. The message is a call to action for students and faculty to appreciate the beauty of our campus and visit the university's Miller Tract, all while keeping in mind the reason it exists today.

## **An Evaluation of the Alfa Romeo 110<sup>th</sup> Anniversary Campaign**

Eleanor Ness and Owen Myers

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### **Oral**

#### **ABSTRACT:**

This project delves into the realms of marketing communication, international outreach, and ethical conduct encapsulated within Alfa Romeo's 110<sup>th</sup>-anniversary campaign. Through meticulous analysis, the project scrutinizes the efficacy of Alfa Romeo's communication strategies while simultaneously proposing innovative avenues for enhancement. Moreover, it carefully juxtaposes the endeavors of Alfa Romeo to TABASCO, shedding light on their adeptness in navigating the virtual landscape amidst COVID restrictions.

The research draws from an array of sources, including the Alfa Romeo and Stellantis company websites, supplemented by historical insights gleaned from platforms like *Passione*, the Alfa Romeo magazine. Furthermore, it delves into the details of award-winning case studies from both Alfa Romeo and TABASCO, providing readers with a comprehensive understanding of the distinct approaches adopted by these two entities. Notably, examining Alfa Romeo's social media footprint during and post-campaign period is precisely conducted, aiming to discern underlying patterns and glean valuable insights for future endeavors.

Ethical considerations are central in this evaluation, as the project aligns its assessment with the standards outlined in the Public Relations Society of America Code of Ethics. Guided by principles of advocacy, honesty, expertise, independence, loyalty, and fairness, the scrutiny ensures that Alfa Romeo maintains ethical benchmarks throughout its campaign.

While acknowledging the success of the 110<sup>th</sup>-anniversary campaign, the research reveals opportunities for refinement. Despite Alfa Romeo's iconic stature in Europe, its brand resonance beyond Europe remains comparatively subdued. To bridge this gap, strategic recommendations are proffered, encompassing potential celebrity collaborations with luminaries like Robert De Niro, Michael Imperioli, and Alfa Romeo's Formula 1 team drivers. Additionally, optimizing social media engagement, particularly on platforms like Instagram, is suggested to better resonate with the United States market and beyond.

## **A Case Study on an App Facilitating Nonprofit Volunteer Engagement**

Harley Wolfgang

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### **Poster**

#### **ABSTRACT:**

This case study project focused on researching, designing, and prototyping an interactive multimedia mobile app to address specific user needs within a targeted demographic for a nonprofit volunteer app. Through a user-centered design approach, the project encompassed user research, persona development, needs statement identification, user journey mapping, wireframing, and prototyping. The user research methods included secondary research on Nonprofit Organizations (NPO's) need to find volunteers to assist in the identification and development of user personas and found that nonprofit organizations tend to have difficulty finding and retaining volunteers. According to North Texas Nonprofit Resources, some reasons that NPO's had difficulty with this was that volunteers are often not matched to assignments they are engaged with, they're often not recognized by the NPO's for their hard work, and they aren't well trained for the jobs they're taking on. A need statement was formulated to articulate the primary problem based on a comprehensive volunteer management system to address challenges related to volunteer assignment matching, recognition, and training. The user journey map and wireframes created visualizations of the end-to-end experience on how it helps NPO's attract and retain volunteers. The result was an interactive prototype developed in Figma to demonstrate how an app could help eliminate the pain points a lot of volunteers face when looking for volunteer opportunities tailored to their interests.

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