Spring 2022

April 18-21, 2022

Welcome to the Hybrid Spring 2022 Celebration of Scholarship and the 18th Undergraduate Research and Creative Activity Forum. This event features research and creative activity presentations by MSU Texas faculty, graduate students, undergraduate students, and Fain Elementary students. A special addition to the Celebration of Scholarship is the Graduate Three Minute Thesis™ Competition.

In-Person Presentations at the Clark Student Center: April 20th and 21st
- April 20th from 1:00-5:00 pm: faculty and graduate student presentation
- April 21st from 9:00 am - 5:00 pm: undergraduate student presentations

Virtual Presentations on Symposium by ForagerOne: April 18th @ 12:00 pm to April 22nd @ 12:00 pm
- Please use the link to access the virtual presentations. Symposium by ForagerOne
- All Virtual sessions are categorized by discipline or you can search by presenter name from the program.
- To access the virtual, you will need to login or register using your institutional email (@my.msutexas.edu or @msutexas.edu and @wfisd.net). This will allow you to comment and see all of the presentations. You will receive an email from the host site if the presenter replies. All comments are monitored and must remain on topic and promote a positive, constructive conversation.

The following abstracts represent hard work and dedication to research and creative work. Presentations are organized by Classification, Presentation Type sorted into like Disciplines.
# Table of Contents

**Faculty and Graduate Student Presentations**
- Faculty and Graduate Podium Presentations ................................................. 3
- Graduate Student Three-Minute Thesis® Competition .............................. 7
- Faculty and Graduate Student Virtual Presentations .............................. 8

**Undergraduate and Fain Elementary Presentations**

**Undergraduate & Fain Elementary Podium Presentations** .......................... 11
- Kiowa Session I- Computer Science, Engineering, and Physics .................. 11
- Kiowa Session II- Fain Elementary ............................................................ 13
- Kiowa Session III- History, English, and Management & Marketing ........... 14
- Kiowa Session IV- Mass Communication and Math Education ................... 16
- Wichita I & II Session I- Engineering ....................................................... 17
- Wichita I & II Session II- Engineering ....................................................... 20

**Undergraduate Poster Presentations** ...................................................... 23
- Comanche Session I- Respiratory Care ...................................................... 23
- Comanche Session II- Biology, Chemistry, Engineering, Biochemistry ....... 25
- Comanche Session IIIA- Engineering ....................................................... 28
- CSC Atrium Session IIIIB- Geosciences and Environmental Science ........... 30
- Comanche Session IV- Accounting, English, Computer Science and Education ... 32

**Undergraduate Emerging Research Poster Presentations** ......................... 34

**Undergraduate Student Virtual Presentations** ........................................ 36

**Acknowledgements** ............................................................................. 38
**The Celebrity Gangster: Benjamin "Bugsy" Siegel**

Zachary Bryce Fulton  
Prothro-Yeager College of Humanities & Social Sciences; Department of History

My Project, The Celebrity Gangster: Benjamin “Bugsy” Siegel, will seek to understand the motives behind his goals and what he accomplished during his lifetime. A strong focus of the paper will be on the background and the rather exquisite life that Bugsy led. Bugsy’s wild and unpredictable life will provide as a crucial point of understanding as to how a mobster/gangster lived. Depictions within film/tv shows have often shaped most people’s understandings of mobsters and have formed countless myths.

I will be utilizing various sources such as the Moffett Library, digital libraries, databases, and digitalized newspapers. The Moffett Library will provide a large amount of scholarly material related to the subject of crime in the twentieth century. Digital libraries will allow access to material not immediately available on campus. Both sources will be consistently used throughout the research paper as it will provide the core understanding of Bugsy along with this era of crime.

The main focuses will be to provide an understandable yet enthralling paper that examines a point in American history that is often glossed over by movies and tv shows. Bugsy’s violent tendencies and “rough” past paint an arguable perfect mobster. Yet, there is much more to be uncovered to fully understand the life of Bugsy. Bugsy retained a significant amount during his life yet over the decades would become polluted with misinformation. This paper will provide a clear and concise understanding of the celebrity gangster Benjamin “Bugsy” Siegel.

**Queen of the Mob**

Karli Smith  
Prothro-Yeager College of Humanities & Social Sciences; Department of History

Virginia Hill was known by many names but “Queen of The Mob” was one of the most well-known. She was born in Alabama and was a ruthless woman, some may say that’s what got her killed. She had become a courier for the mob during the 1930s and was presumed to of committed suicide in Austria in 1966. She was the girlfriend of a major mob boss Bugsy Siegel, and she also in her earlier years had a relationship with Joseph Epstein. She was known as Bugsy’s girl even though he was married. This was a common thing among mobsters to have a wife and a girlfriend. The wife was the homemaker, and the girlfriend was generally the arm candy. The development of my paper is going to be her early life, then move into her life with the Mob and end of her death as well as her legacy. She would fit right into the middle of some of the most powerful mobsters. She was in on the development of the Flamingo Hotel in Las Vegas that is still operating.
today. It is known to have some memorabilia in her honor inside the hotel. Did Bugsy honor his wife at all in the hotel or just his girlfriend? Did the wife have motive to kill her? She was an icon during her time because she did the things most women wouldn’t even dream of, for that I am interested in the innerworkings of Virginia Hill’s life.

The Rise and Fall of Bugs Moran
Lilliana Lopez
Prothro-Yeager College of Humanities & Social Sciences; Department of History
When the twenties are brought up many people think of the glitz and glam. However, it was at this time that Organized Crime was gaining its foothold in America. They were gaining their power, and one of those people that helped Organized crime was George ‘Bugs’ Moran. Although he is not credited, I do believe that he played a major part in the crime world. Bugs Moran was a member of the North Side Gang and would do whatever he could to get money and power. He was on the rise to become one of the most powerful gangsters that Chicago has ever seen. Despite his rise to power, once Moran fell there was no conceivable way that he could rise to the same power that he once had.

Arnold Rothstein: Striking Out with the Black Sox
Joslin Wadlow
Prothro-Yeager College of Humanities & Social Sciences; Department of History
Arnold Rothstein was a Jewish mobster in New York during the early 1900’s. Rothstein is known for his involvement in many illegal activities, he is best known for his hand in the 1919 World Series. During the world series the White Sox were picked to win, but there was speculation that Rothstein paid eight of the White Sox players to lose the game. When the case went to trial there was not sufficient enough evidence to indict Rothstein with the crime. Even without being charged with anything Rothstein earned over 300,000 dollars just on betting on the Cincinnati Reds.

Exploiting Prohibition: The Rise of the Gambling Queen
Rowan Flores
Prothro-Yeager College of Humanities & Social Sciences; Department of History
In 1920, the 18th Amendment was ratified, making the sale, production, and/or consumption of alcohol illegal in the United States. The following thirteen years saw the widespread growth of organized crime across America during the Prohibition Era. Prohibition overlapped with the Harlem Renaissance and saw the rapid growth of policy banking, a form of illegal gambling that provided entertainment and stimulated local economies within Black neighborhoods. As white organized criminal interests focused on flaunting Prohibition, they left space for Black policy bankers to accumulate wealth and power in Harlem. Stephanie St. Clair aka “Queenie” was a young Caribbean immigrant and the only female policy banker who operated on the same level as her male counterparts. Her Caribbean upbringing taught her business skills and shaped her
perception of femininity and race. She lived alongside the elites of the Harlem Renaissance and was an active member of her community, patronizing local businesses and supporting activist organization such as the NAACP. St. Clair flaunted gender roles, advocated for racial equality, and challenged both police corruption and organized crime to maintain her business and protect her community.

**Who lived in the Carriage House?: Identifying the Domestic Workers of the Kell House**
Nathan Endo
Prothro-Yeager College of Humanities & Social Sciences; Department of History

In 1909, the Kell family moved into their newly built home at 900 Bluff Street in Wichita Falls, Texas. However, the Kells were not the only people who regarded the residence as their home. During the early twentieth century, middle and upper middle class white families throughout the American South employed and housed household workers. Black Americans, often women, filled those roles. Moreover, Jim Crow laws perpetuated the subordinate position of those Black Americans in time, place, and memory. As a result, the identities of many of the Kell House residents have been reduced to numbers in censuses or, in some cases, lost to history. Sources suggest that the Kell family employed at least ten people. At least seven of those individuals lived on the upper floor of the Carriage House behind the main museum. By utilizing primary sources like city directories and census rolls, some of the people who lived and labored at the Kell House can be identified. This presentation outlines how to search for domestic workers who left few records of their own. In doing so, it offers up one way of making the history of house museums more inclusive. Too often, house-museums, like the Kell House, focus on the prominent occupants of the homes. Yet many people called these places home. This research project offers a more representative history of early Wichita Falls—a history that will enable more people within this community to claim the home’s history as a part of their own.

Kiowa Room Session II 2:20 – 3:30

**Robot Programming to Simulate Warehouse Logistics**
Dr. Raj Desai
McCoy College of Science, Mathematics & Engineering; McCoy School of Engineering

The purpose of this project was to build and program a webcam-controlled vehicle that can be used to help with warehouse logistics using Arduino micro-controller hardware and MATLAB programming. This device can be used as a forklift to move a pallet or material can be placed on the top of the vehicle. This project will teach the student researcher/s the fundamentals of engineering, key aspects of mechatronics, and MATLAB programming.

We controlled Arduino input/output (I/O) from MATLAB programming. This project introduced student/s to the foundations of programming, electronics, inputs and outputs, digital and analog technologies, and serial communication. This project involves mechatronics which is the synergistic integration of electrical and mechanical
engineering, robotics, computational hardware, and software in the design of products and processes.

The student under the guidance of the professor built and programmed a webcam-controlled vehicle using Arduino micro-controller hardware and MATLAB programming.

We got the robot to work, pick up a pallet with the forklift, and maneuver in a simulated warehouse environment. In the future we would like to improve on the project to add more sensors to the robots and improve on the programming so that the robots can implement collision avoidance, and work somewhat autonomously.

**Swamp Stereotypes in Andrei Konchalovskiy’s “Shy People” (1987)**

Dr. Whitney Snow  
Prothro-Yeager College of Humanities & Social Sciences; Department of History

In 1987, when the movie Shy People debuted to a limited release, critic Roger Ebert praised its director Andrei Konchalovskiy, a Russian immigrant, for “using American images that an American director might be frightened away from.” In the film, family matriarch Ruth still searches for her husband who disappeared into the Louisiana swamps years before. She has locked one son in a shed, mistreats another, and has disowned a third. When her husband’s grandniece Diana visits with the intent of publishing an article about her rural kin, cultures clash, and worlds collide. Diana appears to see Ruth and her family as specimens to be studied and yet, seeks commonality. While Ebert seems to have been captivated, many viewers may have been offended. Much like in the movie Deliverance, there is a scene of sexual violence where one of Ruth’s sons attempts to rape his cousin Grace, Diana’s teenage daughter. That scene, coupled with various others casts the swamp family as animalistic, less than human. But the public loved it—star Barbara Hershey even won best actress at the 1987 Cannes Film Festival. Ebert believed that if the movie had a wider release, it “could have been a best-picture Oscar nominee.” Over three decades later, Shy People is difficult to find. It is not streaming and has never been released on DVD or Blue Ray, just VHS tapes, copies of which are extremely expensive. This paper seeks to deduce why Deliverance became a staple in thrillers while Shy People became obsolete.

**Seeking Refuge: Solo Piano Music for Human Rights**

Dr. Ruth Morrow  
Fain College of Fine Arts; Department of Music

Dr. Ruth Morrow was awarded the second Jane Spears Carnes Faculty Fellowship in Creative Endeavors and spent a good portion of the spring 2020 semester in preparation for a professional recording of solo piano music that heightens our awareness of human rights and social justice issues. This presentation will provide a verbal summary of her work plus a performance chosen from compositions selected for the recording.
Graduate Student Three-Minute Thesis® Competition

Kiowa Room Session III 3:45 – 4:15

**Renaissance Spirituality in Hamlet: A Set-Theoretic Approach**
Lisa D. Moore
Prothro-Yeager College of Humanities & Social Sciences; Department of English

“Renaissance Spirituality in Hamlet” analyzes the characters’ deliberations of conscience that consider actions, both committed and potential, in regard to Christian final judgment to understand how they arrive at their particular decisions. Hamlet’s considerations of conscience are analyzed using mathematical set diagrams for functions of two variables, in which conscience acts as the function. The action considered is treated as the function’s independent, input variable or pre-image mapped under the function of conscience, producing the particular heavenly judgment as the dependent, output variable or image. The set of the input variables contained in the domain is identified as Earth and the set of the output variables contained the codomain is identified as Eternity. Diagramming conscience as a function reveals that conscience typically demonstrates an action’s sinfulness and shortcoming, ideally repulsing a character from committing a wrong action beforehand, exhibiting an inhibitory effect on taking action. Combined with his temporal obligation to answer for his father’s murder, Hamlet desires that his action transform under the function of conscience to result in a good judgment in the codomain of Eternity.

Hamlet comes to realize the imperfection and incompleteness of his actions through conscience, realizing that he can only complete and perfect his otherwise incomplete, imperfect actions by joining them to God-given opportunities to act in a new function I label as “divinity,” in which he joins his will to God’s, thereby acting in the freedom of “perfect conscience.”

**Investigating Equitable Reading Outcomes for Students Identified with Dyslexia and/or Emotional Disorders**
Emily Hardeman
West College of Education; Department of Special Education

According to the Nation’s Report Card (2019), almost 70% of elementary and middle school students are not reading at grade level. For students with learning disabilities and behavioral disorders, this percentage is even lower. According to a study conducted in 2016, the high school dropout rate for students with emotional disorders is 44% and for those with specific learning disabilities, it is 27% (Barrat, 2016).

This study aims to determine if students identified with Dyslexia who have comorbid emotional disabilities are being offered equitable access to structured, systematic, and explicit Dyslexia interventions taught by highly qualified instructors. A quantitative study was conducted to determine if this population of students is receiving Dyslexia specific
There is little existing research on the topic of access to intervention and/or intervention efficacy rates for students identified with Dyslexia and comorbid emotional disabilities. Data on the training of instructors, and the order to determine if outcomes for these students can be improved by training highly qualified interventionists who can also address the more intense behaviors of students with emotional disabilities. The findings of the research are that there are very few teachers who can meet these needs. Children with emotional disabilities are often relegated to less effective interventions due to the inability of instructors to address their perceived behaviors combined with a lack of training, time, additional support, and various other factors mean these students have less equitable and successful outcomes.

**Faculty and Graduate Student Virtual Presentations**

**Encouraging Self-Regulation to Reduce Moral Grandstanding and Mitigate Online Conflict**  
Dr. Andrea R. Bennett  
Dillard College of Business Administration ; Department of Management & Marketing  
This research examines the relationship between consumers’ engagement in moral grandstanding behaviors -- the use of public discourse about morality- and/or politically-laden topics to self-aggrandize -- and their experience of downstream conflict. Over two studies employing the use of both experimental design and linguistic inquiry word count (LIWC), this research provides support for the context in which moral grandstanding is likely to occur and establishes the status-seeking motivation that underlies moral grandstanding behaviors as the mechanism through which grandstanders’ increased experiences of downstream conflict occur. Finally, this research provides evidence that consumers can self-regulate their moral grandstanding behaviors through interventions that provide them with education about moral grandstanding and its deleterious effects and asks them to consider alternative behaviors that might have a greater impact on the morality- and politically-laden topics about which they are passionate. (IRB: 20100801)

**Investigation of the Power Generated by Small-Scale Wind Turbines Using a Wind Tunnel**  
Dr. Pranaya Pokharel, Dr. Salim Azzouz  
McCoy College of Science, Mathematics & Engineering; McCoy School of Engineering  
The area of wind turbines is the subject of intense research given the importance of the field for electricity production. The purpose of this intramural research grant project was to propose a new design of a vertical axis wind turbine that can overcome the restrictions and constraints of a suspended horizontal wind turbine. The new design allows for a bigger electricity generator, large size wind turbines, reduced construction, and maintenance costs. The new design is based around a triangular obstacle that generates shedding vortices. After finalizing the design using the SolidWorks software, additive manufacturing techniques were used to 3-D print two resin based wind turbine profiles and a single obstacle. Tests were conducted in the McCoy School of Engineering
to investigate the turbines performances for electricity production. Power production using a small scale electric generator was measured with a data acquisition system and the LabVIEW software. A Particle Image Velocimetry (PIV) laser system was used to visualize the flow field with generated vortices. Preliminary simulation using the ANSYS Fluent software were performed to verify that the obstacle produces vortices. It is expected that this project will continue under another grant proposal where the data collection system can be improved by adding recording accelerometers and processing the data using the signal analysis tools of the MATLAB software. It is worthwhile to mention that a master student and an undergraduate student worked jointly on this project doing the construction and recording the experimental measurements.

The Relation Between Corporate Social Responsibility and Future Performance: Evidence from Meeting Earnings Benchmarks
Dr. Lin Wang
Dillard College of Business Administration ; Department of Accounting

Corporate social responsibility (CSR) activities enhance firms’ credibility and reputation and help establish good relationships with stakeholders, such as customers, suppliers, employees, and investors. Since CSR activities are not profit-driven, they often come at the cost of firms’ shareholders, detrimental to firm value and financial performance. Prior literature provides mixed evidence on the relation between CSR and future financial performance. The philanthropy hypothesis suggests CSR is not associated with future performance because CSR activities aim to benefit society instead of maximizing shareholder value. The investment hypothesis indicates a positive relation between CSR and future performance since firms undertake CSR projects expecting to generate positive economic returns. The signaling hypothesis argues that firms engage in CSR when they expect future superior performance. Using archival data, I investigate the relation between CSR rating, a proxy for firms’ CSR activity level, and future financial performance. I also examine how CSR rating affects stock returns when firms meet or beat earnings benchmarks. The results support both the investment and signaling hypotheses. I find firms engage in an optimal level of CSR activities, which help improve their future financial performance. Firms also deviate from the optimal CSR level to signal future solid performance. The stock market rewards CSR firms when they meet or beat the earnings benchmarks, but with a smaller premium for firms with high CSR ratings. When firms miss earnings benchmarks by a small amount, CSR rating serves as insurance on future performance and helps mitigate the stock market penalty.

Lucky Luciano and the Castellammarese War
Kenneth Metevier
Prothro-Yeager College of Humanities & Social Sciences; Department of History

Lucky Luciano (1897-1962) served as an incredibly powerful and impactful mafia boss in New York City during the early twentieth century. His rise to power reached its pinnacle as Luciano partook in the Castellammarese War of 1930-1931. This war witnessed the fighting between two Sicilian-American gangs under the control of Joe Masseria and Salvatore Maranzano respectively. Luciano initially fought for and placed his support
behind Masseria, but ultimately he set up his boss's execution after switching to Maranzano's side. What led him to do this? Was this a power move or was it done for stability? The war disrupted avenues of revenue for the New York underworld mafia. The manner in which this will be examined is by looking at Luciano’s increased involvement and rise within organized crime during the 1920s. What were the motivations that spiraled Luciano more and more within the life of organized crime? Following the end of the war in 1931, Luciano rejected the title of boss and organized the five families of New York as we know today into the Commission. It is from this action that it will be suggested Luciano acted in the manner he did during the war due to the desire for peace and stability.

Whiskey-ta Falls Runs Dry: A Brief History of Prohibition in Wichita County
Maggie-Mae Ellison
Prothro-Yeager College of Humanities & Social Sciences; Department of History

In 1929 an amendment passed at both the state and national level that made the production, distribution, and consumption of alcoholic beverages unlawful. For many counties in Texas, these amendments made little difference because they had already created their own prohibition laws. However, Wichita County remained one of the only wet counties in North Texas. In addition to being the only wet county within hundreds of miles, Wichita County saw exponential population growth due to expanding rail lines and an oil boom that brought thousands of oil field workers. The oil field workers brought with them a demand for liquor, which an increasing number of saloons in the county seat of Wichita Falls were willing to supply. With its twenty-six saloons and ever flowing liquor Wichita Falls became known by Texans and Oklahoma as “Whiskey-ta Falls.”

However, following the passage of prohibition amendments saloons closed and liquor sales ceased. What happened next in the relationship between Wichita County and liquor is almost completely absent in the historical record but the sources that are available help create an idea about how prohibition played out in Wichita County. No source on the history of Wichita Falls specifically mentions any details after prohibition took effect in the city. This paper will use a variety of primary and secondary sources to answer some of these questions. For questions that do not have an exact answer this paper will piece evidence together to draw possible conclusions about the prohibition era in Wichita Falls.
Undergraduate & Fain Elementary Podium Presentations

Kiowa Room Session I 9:00-10:40: Interdisciplinary: Computer Science & Engineering and Physics

9:00-9:20
012  Autonomous Drones - Air and Ground - Based Collaborative Network
Sharome Burton
Mentor(s): Dr. Yu Guo and Dr. Eduardo Colmenares-Diaz, McCoy College of Science, Mathematics & Engineering, (Interdisciplinary)
The aim of this project is to design a robust network of ground-based and air-based autonomous vehicles capable of efficiently accomplishing pseudo-intelligent tasks, including path-finding, obstacle avoidance, and collaborative problem-solving. The robots are two small four-wheeled robots and one quadcopter. Both ground and air vehicles are equipped with optical cameras in order to accept visual data from the environment and will be controlled using small, Raspberry Pi microcomputers. The network that this project designs is one where quadcopter will tracks the area of operation of the two robots, providing a top-down view of the field and revealing the locations of any possible obstacles, or other points of interest. A top-down view of the entire landscape provides significantly more information about the area than just the view from the perspective of the robots. The goal is to have the quadcopter communicate the information from this top-down view to the robots in order to facilitate the solving of a specific problem on the ground. This project will develop this network by first creating a simple simulation environment for the two robots with a top-down view. This simulation environment would be used for the researchers to solve these path-finding or obstacle avoidance problems by writing or applying algorithms on their own. Using the simulation environment, the researchers will apply a form of machine learning called reinforcement learning to train artificial intelligence (A.I.) agents to navigate these problems on their own at an acceptable level of efficiency.

9:25-9:45
013  Design of an Exoskeleton using servo motors
Edvin Benjamin,
Mentor(s): Dr. Tina Johnson, Dr. Pranaya Posharel, McCoy College of Science, Mathematics &
Engineering, computer science, mechanical engineering
The purpose and aim of the lower limb exoskeleton is to provide mobility to individuals with limited mobility. The goals of this research project are, the ability to smoothly transition from automatic to manual control, the ability to mechanically balance itself and to achieve a smooth moment while walking. The main components for the project are the four servo motors. These motors can be controlled automatically with the use of an Arduino nano, and they can be controlled manually with the transmitter. A switch is used to give the user the ability to transition from automatic control to manual control. A computer program named Arduino IDE is used to upload the required code to the Arduino nano. The motors are connected to the left knee, right knee, left side of the hip and right side of the hip. Adjustable rods are connected to every servo motor on the lower limb exoskeleton. When the servo motor connected to the hip is rotated, the rod strapped to hips will move thus controlling the thigh movement. When the servo motor on the knee rotates, the rod attached to the leg will move. Currently the student is calculating the torque required from each servo motor using Python, finalizing the design in solid works, and is working on a self-balancing prototype for both legs. The objective for this research project are to construct and test the four leg extensions, test the self-balancing mechanism, conduct test runs using the test dummy and finalize the Arduino code.

9:50-10-10

**O14 ROBOTIC soccer using artificial intelligence**
Kuwin Wyke, Sharome Burton,
Mentor(s): Yu Guo, McCoy College of Science, Mathematics & Engineering, Mechanical Engineering
The ultimate objective of this project is to get fully autonomous robots capable of interpreting their environment and make discounts to play a game of soccer together. So far we have been able to create an object detection algorithm to find the ball and measure its distance and created a simulation of what we expect the real world single robot experience to be. Currently, we are creating the neural network and investigating how to properly train a neural network using reinforcement learning. To accomplish this task, we are using the programming language python and a Deep Learning library called Stable-Baselines3 which standardizes a lot of neural network implementation allowing us to focus on the training of said neural network. Looking forward we are simultaneously ensuring that our simulation and training methods are applicable by creating algorithms to ensure we can can gather all the information we are feeding to the neural network. In this regard we are working a spatial algorithm to locate the robot on the X-Y plane of the soccer field using QR codes at fixed locations around the field.

10:15-10:35

**O15 Quantum Electro Dynamics Process involving muon-muon pair in the Muon g-2 Experiment**
Kendra Jean Jacques
Mentor(s): Dr. Preet Sharma, McCoy College of Science, Mathematics & Engineering, Physics
Muons belong to the lepton category of particles which are the smallest in their category and cannot be broken down into composite particles. Leptons are expected to behave in a similar manner even though their masses differ from each other. The muon is about 207 times heavier
than the electron and this makes it an extremely sensitive candidate to detect new physics or new particles present in our Universe. Our Universe is known to be mostly vacuum. However, vacuum does not truly mean emptiness or the absence matter. Vacuum is filled with virtual particles which regularly come into existence and undergo interactions with other particles, matter, and even photons. These virtual particles can be any of the known particles such as virtual photons, electrons, or even massive particles such as the W-boson, Z-boson, or even Higgs. A very unique property of virtual particles is that they are so massive that they cannot be made in accelerators such as CERN or FermiLab and it is even harder to detect them at accelerators. These virtual particles interact with the muons and can give rise to a new phenomenon that has not been detected before or even understood in the current framework of physics. Our project is to calculate the branching fraction of lepton pairs decaying to muon pairs.

Kiowa Room Session II 10:45-11:15: Fain Elementary, Wichita Falls ISD

Grade 3
Food Chains with 2- or 3-Dimensional Attributes
Mentors: Ms. Rebecca Venzor
Students will research food chains and create food chain models using two- and three-dimensional figures. After creating models, they will be able to explain the difference between two- and three-dimensional figures using their attributes. They will explain why the sun is important in the food chain and determine what animals need to survive.

Grade 4
The Shape Museum
Amyah Barboza, Miles Blair, Ana Claire Fernberg, Nolan Pendley, A'Nyah Sherrer
Mentors: Ms. Jennifer Anderson, Ms. Laura Wetzel
How can we as exhibit designers demonstrate the important role shapes have in our world? In this project, students learn about the different geometric shapes in the world around them (e.g., rectangles, squares, trapezoids, etc.). Through a combination of photographs and art, their exhibits will serve to educate others on the attributes of shapes and how one might encounter them in the world. As the 4th grade class at Fain Elementary, we will create an EDP project with the goal of promoting awareness and designing an exhibit on a particular shape using photographs and art to show the shape in our world. Students will also design an architectural house or building based on Frank Lloyd Wright's vision. They will combine nature to a structure and convey the importance of shapes in written form. The results for this project are for students to understand, demonstrate, explain and record their evidence and provide the purpose of shapes as they introduce to an audience during the project. With this project students will achieve higher regard and respect toward shapes and the geometric forms of math. Fain’s 4th grade class will be responsible for their journal as they partake in discovering how shapes impact our world. The overall goal for this project is to learn how geometric shapes in two or three dimensions are used in design, architecture and construction of objects, buildings and art. Learning the distinctions in shapes expects for the students to concentrate on the particular attributes.
Grade 5
Wagons of the Western Expansion
Khloe Staresinic, Jace Gardner, Lawson Berend, Maya Mziguir, Serenity Diggs, Trevor Shed
Mentor: Ms. Kacy Moses
Focus Objective: How might we as pioneers design a wagon with working wheels that can hold 5 lbs and travel 10 feet or more? Our 5th grade students here at Fain Elementary dove into the engineering design process to create a working model of a wagon used during western movement travel back in the 1800’s. In reading we studied about the western expansion and how the pioneers survived during this transition period. In science we studied weather patterns and how this affected their travel as all they had were their wagons for cover. In math the students studied geometric shapes and how they could utilize certain shapes with their belongings to be able to fit into their wagon as they only had little room to carry all of their personal belongings including food and furniture. A lot of thought process went into adding all the additional factors into this project. Working collaboratively with their groups they will complete this process and be able to present their knowledge, trials, errors and successes.

Kiowa Room Session III 1:00 -2:30: English, History and Management & Marketing

1:00-1:20
O16 Unexpected Saviors: Viking Influence on Early Medical Russia
Kelsey Davis
Mentor(s): Dr. Tiffany Ziegler, Prothro-Yeager College of Humanities & Social Sciences, History
The Varangians, under the new leadership of Rurik (r. 862-79) and his successors, allied with empires such as the Byzantine and the Abbasidid Caliphate, causing these empires to provide the means for the Varangian rulers to advance politically and culturally within various parts of Western Europe. Through a careful reading of the sources, it is seen that the Rus created a proto-centralized government for the East Slavic Tribes, which not only brought stability but also provided the foundation for a Varangian dynasty to form. In addition, through an analysis of Constantine VII’s De administrando imperio, a parallel relationship is identified with the Byzantine Empire and the surrounding areas, which allowed the Rurik dynasty to not only maintain power in Kiev, but also strengthened their power. This relationship helped further the idea of Russia becoming the “Third Rome” after the fall of the Byzantine Empire, thus creating a legacy that modern countries claim: the Kiev-Rus ancestry has become a political conflict, as not only does Russia claim the ancestral Kiev-Rus statehood as theirs, Ukraine does as well.

1:25-1:45
O17 Tu Voz: Latinx & Gender Expectations
Stephanie Robledo
Mentor(s): Dr. Hillary Coenen, Prothro-Yeager College of Humanities & Social Sciences, English
The purpose of this study is to analyze rhetoric used by Latine to protest gendered cultural expectations and double standards within their families and to create a documentary-style podcast that makes these findings legible to a broader audience. These gendered expectations and double standards are upheld through machismo and marianismo. By highlighting the Latine experience with gender roles, it brings personal acknowledgment to Latines feeling powerless
in these situations. This acknowledgment gives them a greater sense of self and power to choose whether to be guided by the influence of machismo and/or marianismo or to break away from it. While this podcast is primarily for Latine who experience these trends, it is also available for those that want insight into the Latine experience. This study considers ‘How Latines understand and engage with cultural gendered expectations and double standards within their families’ in a podcast that relies on a series of interviews. Interviewees are Latines that were raised alongside a cousin or sibling of a different gender and had an older family member such as a parent enforcing gender roles. The interviews are being used in the production of three 20-minute podcast episodes. The first one focuses on Latinas and marianismo, the second one focuses on Latinos and machismo, and the last one analyses how both terms work together to implement gender roles. Once complete, the podcast may be submitted for electronic distribution through *The Wichitan*, the MSU Texas newspaper with an accompanying article. IRB# 22011401

2:00-2:20

**O18 Determining Basic Accommodations that can Increase Employment Success for Individuals with I/DD Within a Bakery Context**

Amira Johnson

*Mentor(s): Dr. Andrea Bennett, Dillard College of Business Administration, Management & Marketing*

The U.S. Equal Employment Opportunity Commission (EEOC 2013) estimates that nearly 2.3 million Americans have an intellectual disability—characterized by an intellectual functioning (IQ) score below 75 and significant limitations in conceptual, social, and practical adaptive skills that originated before age 18 (American Association on Intellectual and Developmental Disabilities 2021)—and that the majority of such adults are “either unemployed or underemployed, despite their ability, desire, and willingness to engage in meaningful work in the community.” The unemployment problem persists for many reasons, including employers’ beliefs that individuals with intellectual and developmental disabilities (I/DD) are unable to perform as well as their coworkers who are neurotypical and that costly accommodations are required (Aichner 2021). This research posits that individuals with I/DD can perform as well as other employees and, though accommodations are necessary, not all accommodations are costly. Further, this research hypothesizes that bakeries seeking to employ individuals with I/DD could implement basic accommodations—in addition to ADA requirements—to increase the likelihood that such employees successfully contribute to the profit-making of the business. This hypothesis is tested using a pretest/posttest design in which members of a area nonprofit and university students (the comparison group) complete a chocolate chip cookie recipe once with a traditional recipe and then again with a modified recipe. The choice of the accommodation was sourced from depth interviews conducted with seven business leaders of for-profit and non-profit bakeries and cafes in which they were asked about their experiences in employing individuals with I/DD (IRB Approval #: 21120801).
Kiowa Room Session IV 3:00-4:30: Mass Communication and Education

3:00-3:20
O19 Who's Included? Examining Diversity in Teaching Literary Journalism
Emily Copeland
Mentor(s): Dr. Mitzi Lewis, Fain College of Fine Arts, Mass Communication
This research into teaching practices of writing educators began a decade ago and has explored different questions each year. To explore the question “Who’s Included?” we created a web-based survey and distributed it by email through the International Association for Literary Journalism Studies (IALJS) mailing list; two AEJMC divisions list servs; three Brazilian academic organizations: Intercom, Compós, and SBPJoR; the Chilean Association of Communication Research; and the Latin Association of Communication Research. We are using mixed-methods data analysis, consisting of descriptive statistics for closed-ended questions and thematic analysis for open-ended questions. We started by importing survey responses into NVivo and are in the process of coding them to see which areas of diversity are receiving attention from the professors. So far, race and ethnicity are the most reported areas with almost double the next closest frequency of mentions. Gender is second, specifically women and transgender writers and topics, and LGBTQ+ is the third most mentioned. There are multiple other areas reported such as economic status, religious affiliation (or, specifically, no religious affiliation), disabilities, immigrants, migrants, violence, and war. Our findings indicate that survey respondents see gaps in the diversity of their curriculum and that they are working to fill those gaps. Professors gave examples of writings and writers they are including in their curriculum and they shared ideas and program changes they are implementing in their classrooms. IRB#16030201

3:25-3:45
O2 “The Color Hidden from View”
Marissa Salinas, Miranda Salinas
Mentor(s): Professor Jonathon Quam, Fain College of Fine Arts, Mass Communication
“The Color Hidden from View” is a story about the intersection of artistic expression and the experiences which form a person’s outlook on the world. It starts as an exploration of the abandoned grain mill just off HWY 287 in Wichita Falls, Texas; but blossoms into a character study of the man who owns this facility. His surly, unique and assured outlook on the world has allowed for the most unlikely of alliances between him and the graffiti artists who have covered the interior of his building with incredible murals and works of art. This poetic documentary finds a parallel in the hidden stories of his character and the hidden beauty of these murals. The film utilizes a mix of interviews and observational material to craft a portrait of a man standing firm in the place he believes should exist because he wants it to. The final documentary will be between five and ten minutes in length with original music from Bobby Lewis, the MSU Texas Choirs and Joel Shanahan.
O20 Enhancing Culturally Relevant Math Tasks with Multicultural Literature
Molly Melloan, MSU Texas-Flower Mound
Mentor(s): Dr. Dittika Gupta, West College of Education, Early Childhood Education EC-6
Teaching with a commitment to culturally relevant pedagogy recognizes the need for preservice teachers (PSTs) to have structured learning opportunities to explore culture in the context of mathematics pedagogy and content. For PSTs to engage in such practice, PSTs must have mathematics methods courses that enable them to learn about and build on the cultural assets and identities that students bring to the classroom (Association of Mathematics Teacher Educators, 2017; Ladson-Billings, 1995). One way to recognize culture in mathematical studies is by integrating multicultural children’s literature to make connections between mathematics and students’ cultural experiences (Mendoza & Reese, 2001). The culturally relevant tasks encourage student engagement and participation through connections between mathematics and students’ cultural experiences and inclusion of diverse student populations. This project thus aims to enhance educational experiences for PSTs by using multicultural picture books that give voice and agency to characters of color, engaging preservice teachers in giving children from diverse backgrounds messages of resiliency, creativity and strength situated in the context of mathematics. The research question for the study is: What are elementary PSTs’ experiences integrating multicultural literature with mathematical concepts to design culturally relevant mathematical tasks? Using an action research methodology and open coding, the results of the study demonstrate PSTs’ growth in awareness of and confidence in using multicultural texts to explore mathematical concepts along with their understanding of how the tasks elicited culturally relevant mathematical thinking with targeted concepts (e.g., multiplication, geometry, patterns).

IRB#22020101

Wichita I & II Room Session I 9:00-11:35: Engineering

9:00-9:20
O1 Design and Control of a Gravity Compensation Mechanism for Human Lower-Limb Rehabilitation
William Loveland, Ben Westwick
Mentor(s): Zeki Ilhan, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering
The aim of this work is to demonstrate the feasibility of a novel two degree-of-freedom suspension system as a rehabilitation device for people with lower-limb injuries through mechanism-control design integration. The proposed mechanism, which combines a basic four-bar parallelogram linkage with an extra link and two tension springs, is inspired from the gravity compensation approach for space research as it provides a reduced weight or even a weightless experience for the suspended person. Although a series of efforts have been made to fabricate a working prototype of the theoretical linkage design since Fall 2020 semester, the main purpose of this work is to summarize the progress made during the Spring 2022 semester with the reduced-weight wooden prototype equipped with smoother joints and more effective spring and pulley configurations to allow for a smoother operation even under the absence of
external actuation. On the other hand, an inverse kinematic study is performed to transform a specific walking pattern trajectory in the workspace to the joint space to extract the target joint variables based on an ideal human walking pattern scenario. To initiate the control experiments, a stand-alone feedback control system is also designed using two DC-motors with built-in encoders, a motor driver with dual motor speed control capability, and the Arduino microcontroller to implement a simple PID control algorithm. Plans toward the controlled, closed-loop operation are discussed based on the initial performance results achieved with the new prototype, and possible improvement areas are addressed for the future work.

9:50-10:10

O3 Automation of a Dual Planetary Gearing Transmission Using Control Mechanisms and a Programmable Logic Controller
Olivia Fadow, Skyler Leonard
Mentor(s): Dr. Salim Azzouz, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

The aim of this project is to design control mechanisms to automate a manual dual planetary transmission. The control mechanisms are a combination of mechanical and pneumatic systems that are activated by a Programmable Logic Controller (PLC) program. The transmission will be used in the Machine Elements Design Laboratory to educate students on gear transmission and levers systems. The Solidworks software was used to design and simulate the mechanical parts of the control systems and create visualizations of the final control systems. The first control system uses vertical levers and linear actuators to control the brakes, while the second uses horizontal levers and rodless pneumatic cylinders to control the clutches. The designed mechanical parts were then sent to a machine shop for manufacturing. The Willis Gearing Theory was used to determine the six chosen velocity ratios realized by the transmission. To automate the mechanical parts of the two controlling mechanisms, a PLC code was programmed in the Productivity 2000 software and uploaded to the CPU console. A Human Interface Machine (HMI) has been connected to the PLC console to allow a manual control of the transmission and to display the system speed and torque readings. Testing will be performed after the control mechanisms are assembled to compare the theoretical velocity ratios to the experimental mechanical advantage. The transmission is currently being assembled and will be completed and tested before the end of the Spring 2022 semester.

10:15-10:35

O4 Investigation of a Dual Vortex Stabilizing Obstacle with Built-in Vertical Wind Turbines
Cykelle Semper, Ernuel Tonge
Mentor(s): Dr. Salim Azzouz and Dr. Pranaya Pokharel, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

Vertical Axis Wind Turbines (VAWTs) have a rotating axis that is driving a ground electricity generator. As horizontal axis wind turbines, the proposed VAWT assembly needs to face the direction of the incoming wind to operate and generate a sustained vortex. Because of the beneficial and convenience of the vertical orientation of the VAWT, the electricity generator can be easily mounted on the ground with reduced costs and ease of maintenance. The main component of the proposed system is a wedge based design to generate local and stable
vortices. The designed wedge has two tapered cones with a Venturi exit tube each. The two cones house two vertical airfoil based wind turbines connected at the bottom to two electricity generators. When the air vortex comes into contact with the airfoils, a lift force is generated which allow the turbines to rotate and thus generate power. The SolidWorks software was used to design the wedge and the turbine assembly. STL files will be created to 3D-print the whole assembly. Once, the assembly and its components are mounted on the McCoy School of Engineering wind tunnel, a series of experimental tests will be conducted with the LabVIEW software to study the performance of the proposed system. It is expected that the team of students and faculty will complete the testing phase by the end of the spring 2022 semester.

10:40-11:00
**O5 Automation of a Chain Coupled Double Planetary Gear Transmission**
*Megan Cann, Abraham Moreno, Robert Speed*
Mentor(s): *Dr. Salim Azzouz, McCoy College of Science, Mathematics & Engineering, Engineering, McCoy School of Engineering*

A new type of transmission has been developed at Midwestern State University to approach the performance of an ideal transmission. The new transmission has twenty different gear ratios and consists of a double planetary gearing system linked by a set of three chains and sprockets. A senior design engineering team is currently working to transform and improve the transmission from a manual one to an automated one. The main purpose of this project is to modify and control the entries and exits shafts of the transmission to allow for the realization of each gear ratio automatically. This task is realized through the development of an innovative clutching and braking system. The team first used the Willis Gearing Theory to determine the system’s theoretical gear ratios. Next, the entry and exit shafts of the transmission, as well as the clutching and braking systems were designed using the SolidWorks CAD software. The two-dimensional and three-dimensional blueprint drawings of each designed part were then sent out to a machine shop for manufacturing. The team plans to program and use a programmable logic controller (PLC) to automate the transmission through a moving clutching keyed rods and sensors. The team is expected to test the transmission by the spring 2022 semester. The theoretical velocity ratios will be compared to the measured mechanical advantages to determine the overall efficiencies of the transmission for each gearing ratio.

11:15-11:35
**O6 Shifter Mechanism with Integrated Hand Clutch for Formula SAE Car**
*Luis Gonzalez, Jacob Rowland, Trevor Snyder*
Mentor(s): *Dr. Pranaya Pokharel, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering,*

This project was made for the purpose of designing a clutch and shifting mechanism for a formula-style car drive train. The project is part of the design and manufacturing of a full car done by the Formula Society of Automotive Engineers (FSAE) at Midwestern State University. The current study proposes the idea of a semi-automatic clutching system together with a mechanical gear shifting system. The concept is that while the gas pedal is being pushed down until a certain angle, it will actuate the clutch automatically. The proposed clutching system utilizes a rotary position sensor, a servo motor, and a communication system between the two.
The shifting is mechanically operated using a shifter that is connected to a solid rod that actuates the gear selector on the transmission. The system is completely designed and is in the process of implementation. Further testing will be conducted in order to verify that the proposed design has advantages. The three major advantages of the system is the elimination of the clutch pedal, and two fail-safe scenarios allowing the driver to safely come to a stop or be able to finish the race. The design is also beneficial for the longevity of the gearbox which will preserve for future uses of the current FSAE engine. The students were able to complete the entire project beginning from the conceptual stages to the implementation stages. The team was able to employ engineering solutions for innovative research.

Wichita I & II Room Session II 1:00-3:20: Engineering

1:05-1:25
**07 Autonomous Control Systems in High-Powered Rocketry**
Samuel Campbell, Dylan Peterson
Mentor(s): Dr. Yu Guo, Dr. Terry Griffin, McCoy College of Science, Mathematics & Engineering; Computer Science and Engineering (Interdisciplinary 2)

Sounding rockets are rockets that carry a payload for scientific research and are widely used around the world. The issue with these rockets is that they often have expensive guidance systems that require high end electronic components and a great amount of red tape from the government. We wish to create an autonomously stabilized rocket as a cheaper and easier to attain alternative. The rocket will not have guidance, but instead it will have a stabilization system that will keep the original orientation of countering the horizontal drift in the ascent that often occurs with rockets. This will be achieved by the use of a microcontroller to measure the accelerations a rocket experiences in flight and make course corrections based on those accelerations by fin actuation. We have purchased the components necessary for our first non-stabilized flight and have constructed the airframe of the rocket. The final step before launch is programming and testing the recovery system. This system will utilize the same microcontrollers mentioned previously to determine the optimal point in the flight to deploy the drogue and then main chutes, which will enable us to safely recover the rocket post flight. To this end we are currently in the process of testing the accuracy and sensitivity of the electronic components for our recovery system. If both our Altimeter and Accelerometer/Gyro/Magnetometer are proven to be reliable we will continue on with programming our recovery system.

1:30-1:50
**08 Fully Articulating Robotic Hand**
Nodebechukwu Okoye, Adam Weatherred
Mentor(s): Dr. Yu Guo, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

Robotic hands are used in many avenues of the world, ranging from industrial to personal use. All of the varieties of these hands aim to accomplish one thing; mimic the functionality of the human hand. While many of these designs are effective, many of them are either bulky or require additional space to house the servo motors. This project aims to design and construct a
fully functioning robotic hand that not only mimics the form and function of a human hand, but also houses all servos within. These servos will actuate a cable driven tendon system that will nearly replicate the full range of motion of a human hand. This system will be integrated into a modular assembly of 3D printed segments. These segments mimic the dimensions and relative shape of their human counterpart. This system will then be attached to a custom 3D printed palm that will provide wire routing and concealment for each of the fingers. Completion of the project will result in a lightweight yet compact multi-degree of freedom hand.

1:55-2:15

**O9 A Fixed Wing UAV with Vertical Take-off and Landing**
Miguel Bethel, Nedabiah Warner
Mentor(s): Dr. Yu Guo, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

The overall purpose of this project is to build an unmanned aerial vehicle (UAV) with high power efficiency and long flight time. As recent battery technology isn’t advance enough for fully powered electric flight, we intend to produce an aerodynamic design that is capable of overcoming this constraint. Investigating this project requires us to use Computer Aided Design (CAD) software to create various designs of the UAV. These designs are then tested via Computational Fluid Dynamic (CFD) simulations under various conditions. The final design is then constructed, flown and tested via a radio controlled system. A different aircraft based on a traditional fixed wing design is also constructed and flown. The electrical data and flight times of the two aircrafts are then recorded and compared. Current analysis shows a high wing aircraft with a high aspect ratio to be very effective at producing lift for the UAV. The UAV is also equipped with a tri-motor set up that consists of two rotating motors that will lock in place horizontally or vertically and one stationary ducted fan motor for additional stability. In conclusion, we expect that the fixed wing VTOL UAV will outperform the regular fixed wing aircraft in both flight time and energy efficiency. The fixed wing VTOL design is expected to be useful to the UAV by reducing the amount of time the UAV needs to get in the air while also fully taking advantage of lift to reduce the energy expenditure of the motors.

2:20-2:45

**O10 The Study of a Servo Driven Pendulum Oscillator**
Patrick Connelly, Bailey O’Dell
Mentor(s): Dr. Yu Guo, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

The Servo Driven Pendulum Oscillator is a mechanical device that will be utilized to simulate vibrations in order to obtain a better understanding of the effects that those vibrations have on structures and mechanical devices. The main goal of the project is to transform rotational motion to linear motion in order to stimulate rotational motion in the pendulum. Ideally, the pendulum will be controlled well enough to become fully inverted and remain balanced in its upright position. For this to occur the servo motor will gain speed, and the pendulum will begin to swing back and forth. Then the servo motor will induce a jolting force that will fully invert the pendulum and will then be balanced by the servo motor. Before the assembly of our device, we will run stress tests in SolidWorks to determine any weak points in the system. We plan to test
the system with varying sizes and masses of pendulum rod and weight components until we determine an optimal combination. This project will allow us to study the effects of the force and acceleration of each block, as well as the pendulum. The majority of previous experiments related to pendulums do not incorporate a servo motor to drive the movement of the pendulum. Its inclusion will allow users to further study the pendulum for future uses.

2:50-3:10

**O11 Determination of the Convection Heat Transfer Coefficients for Multiphase Flow on Different Sections of a Closed Piping System**

Tyler Leonard, Benton Vidal

**Mentor(s):** Dr. Mahmoud Elsharafi, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

The continuous demand for petroleum-based energy as well as the increased need for geothermal energy has led to higher demands of piping systems transporting multiphase flows at high pressures and temperatures. As a result, the research of multiphase heat transfer throughout the piping system is inevitable, much of which the intricate details are still unknown. Multiphase flows and heat transfer have been studied in a wide range of applications such as mechanical, chemical, nuclear, and mineral engineering. The data from this project should prove useful in industries all over the world, especially industries that deal with refrigeration and with piping oil. Also, engines are massively important and their efficiency is becoming more prominent than ever before, and this research could aid in their efficiency. Also, the longevity and performance of these multiphase-flow piping systems, amongst other things, depend greatly on the heat transfer rates they obtain. In this experiment, the aim was to create a model of the internal pressure and temperature associated with a piping system (like that of oil extraction) which allowed testing and improvement upon existing systems through recommendations of increased efficiency and minimal waste. Water in the system represents the liquid, while air will represent the gas. The focus was placed on the change of temperature at the heating sections with a change with vertical, 45 degrees, and horizontal orientations through the use of thermocouples, NI9211, computers, and Labview software in order to obtain and record the data.
P1 Smoking Outcomes According to College Students
Reagan Branicky, Christian Evans, Ashley Gonzales, Anthony Riley
Mentor(s): Dr. Randy Case and Dr. Jessica Fino, Gunn College of Health Sciences & Human Services, Respiratory Care

College is known as the time of experimenting and trying new things. Unfortunately, some of the decisions that college students make are not the best options for their health. Some of these “new habits” can include smoking e-cigarettes, vapes, and/or marijuana. However, it is questionable whether college students have a good understanding of the effects related to smoking. The purpose of this study is to better understand college student trends and connotations as it relates to smoking cigarettes, e-cigarettes, and marijuana. This survey was performed on 40 random college participants. The survey consisted of 21 questions ranked from 0-9 as to if the participant agreed or disagreed with the question. It was disclosed to the participants that their answers would be anonymous. Preliminary results from the study indicates that a significant number of surveyed college students do not actively smoke. Additionally, a large percentage of those surveyed were aware of the negative effects and consequences associated with smoking. Many of the students who identified as smokers associated the use of the products with psychological dependence. A large percentage of the student population at Midwestern State University do not smoke and are aware of the detrimental side effects that come with smoking and vaping. Continued and enhanced education about the hazards and complications associated with smoking could prove beneficial for the college student population.
IRB Approval #22021702

P2 Students’ Perceptions of Effective Teaching Characteristics of Clinical Instructors
Madison Contreras, Mark Everett, Fatima Romo
Mentor(s): Dr. Randy Case, and Dr. Tammy Kurszewski, Gunn College of Health Sciences & Human Services, Respiratory Care

Clinical instructors play a vital role in building student knowledge, skills, and preparing them for a professional career. Often instructors and clinical preceptors influence the student’s view of their profession. In addition, the interactions and communication between clinical preceptors and health science students can play a vital role in the success of students. Purpose- This study focuses on clinical students’ perceptions of desired characteristics of effective preceptors. This research explores factors such as professional competence, relationships with students, and personal attributes during hospital-based clinical experiences. Method- Research was obtained through surveys issued to healthcare students enrolled at Midwestern State University in the following disciplines: Nursing, Radiology, and Respiratory Care. The survey contained a thorough assessment and questions to evaluate and obtain information about the student’s perception of clinical preceptors. Results- Preliminary results demonstrated that students value clinical preceptors who are knowledgeable, engaging, encouraging, and are enthusiastic about teaching.
as the most important attributes. Conclusion- Health care students are placed in fast-paced hospital settings in which they look for role models within their profession to help them flourish their skills. Hospital educators can use this research to target these characteristics within their own departments and determine effective clinical preceptors that can contribute to the growth of future healthcare professionals.

IRB # 22021705

**P3 Sleep Patterns and Associated Behaviors in Health Science Students**

_Huldah Nyabera, Melanie Joseph, Khadijah Ross, Zhante King_

Mentor(s): _Dr. Randy Case and Dr. Erica Judie, Gunn College of Health Sciences & Human Services, Respiratory Care_

It is recommended that an individual should get approximately 7 to 8 hours of sleep per night for the body to be in optimum condition to function. As health science students, we hypothesized sleep to be a rare commodity. Purpose: The purpose of this study was to identify the sleep patterns and health-associated behaviors among MSU Texas health science students. This study has the potential to determine factors that may affect the sleep patterns and behaviors of MSU health science students. Methods: Definitive research from several accredited sources that report on sleep, sleep patterns, and/or behaviors, as well as sleep studies specific to health science were reviewed. In addition, a likert scale survey of 12 questions was conducted with 40 random health science students at MSU. Results: As per our survey, we discovered that health science students at MSU slept an average of 7 hours a night, which is considered the recommended amount for restful sleep. However, it was revealed that although the required sleep hours were met, students had difficulties sleeping through the night, stating that sleep was not quite as moving, they were drowsy or sleepy during the day, and felt as though they were not getting the amount of sleep needed. Conclusion: Health Science students at Midwestern State University are obtaining the necessary hours of sleep, but the average sleeping patterns and behaviors of the students show that sleep is not restful. Providing techniques and strategies for improved sleep could be beneficial for this population of students. IRB # 22021704

**P4 Beliefs and Barriers Towards Vaccinations Among College Students**

_Jacqueline Camarillo, Brynna McVey Acelynn Medrano, Uriel Villarreal_

Mentor(s): _Dr. Randy Case and Prof. Mary Sue Owen, Gunn College of Health Sciences & Human Services, Respiratory Care_

Vaccinations have always been a topic in which most people have varying opinions. With the recent pandemic and the COVID vaccine implementations, the topic has quickly gained momentum again. Purpose: This research evaluates how college students perceive the idea of receiving vaccinations, including the following questions regarding vaccinations: What is the general knowledge that college students have towards not only the COVID vaccination but other vaccines as well? What are the beliefs that individuals possess concerning vaccinations? Methods: The method used was a mixture of qualitative and quantitative data. We went throughout the Midwestern State University campus and randomly handed out forty surveys to students. The survey consisted of eighteen questions and asked a variety of questions regarding how the students felt about vaccinations. After finishing the surveys, the data was collected and analyzed. Results: Preliminary results show an overwhelming number of students that possess a
lack of knowledge of what vaccinations entail as well as the pros and cons of vaccinations. We also found a number of students who either strongly supported or strongly opposed vaccinations. Conclusion: Based on our findings, the perceptions and beliefs regarding the use of vaccinations vary widely among college students. College students could potentially benefit from enhanced vaccination education. IRB#22021701

P5 Depression, Anxiety, and Stress Among College Students
Malorie Emory, Karly Frazier, Emma Johnson, Miranda Lopez
Mentor(s): Dr. Randy Case & Dr. Jennifer Anderson, Gunn College of Health Sciences & Human Services; Respiratory Care
Depression, anxiety, and stress among college students is a common pattern that is seen across campuses worldwide. This has been a common concern in students for years but has been a growing obstacle since COVID-19 began and has continued to rise. These feelings are a common variable in not only students but as well as staff members on campus, which leads these individuals to seek some form of relief such as counseling or therapy. Purpose: This research explores the information behind college students’ emotional feelings while adjusting to how depression, anxiety, and stress affect their lives. Methods: Ten published articles were read and reviewed that had viewpoints from other students at different college campuses to get a basis of how other students feel outside of our community. In addition, research was collected through a random sample survey of forty students at MSU Texas to observe their outlook on how depression, anxiety, and stress affect them. Results: Formative results exhibit that an elevated number of students suffer from depression, anxiety, and stress due to the following: missing family, having issues with friends, drowning in schoolwork, feeling not wanted, and social standards. Conclusion: College students tend to get caught up comparing themselves to others’ accomplishments, are too hard on themselves when it comes to social standards, and pay close attention to the environment that is surrounding them as they perform everyday activities. All of these situations in addition to others play a significant role in triggering the feelings of depression, anxiety, and stress among college students. IRB#22021703

Comanch Session II 11:00-12:00: Biology, Chemistry, Engineering, Biochemistry and Physics

P6 Relationship of Fungal Symbionts in Honey Locust Trees
Ashley Alvarez
Mentor(s): Dr. James Masuoka, McCoy College of Science, Mathematics & Engineering; biology
Native Americans use the seedpods of Honey Locust (Gleditsia triacanthos) to keep wounds free of infection. Therapeutic agents extracted from plants are often produced by symbiotic microorganisms not the plant itself, as is the case of the breast cancer drug Taxol. The objective of this study is to determine if the Honey Locust itself, or a fungal symbiont, was the source of the antimicrobial activity. Honey locust seed pods and leaves were obtained from trees in Wichita Falls and Lubbock. The seedpods and leaves were surface sterilized with ethanol and bleach then used to inoculate growth media. Isolates growing out of the specimens were sub-cultured twice to ensure purity. Pure culture isolates were compared using colony and microscopic characteristics. From these samples, five unique isolates were obtained from Wichita Falls and two from Lubbock. Preliminary identification of the isolates was determined using physical
characteristics. Based on these characteristics one isolate appears to be common to both locations. Additional identification information was obtained from DNA sequence analysis. These data together confirmed one isolate as being in the genus Penicillium and a second isolate was identified as Alternaria. One DNA sequence returned as “fungal endophyte isolate” suggesting this may be a new species. Additional testing is being conducted to identify the remaining isolates. Current work also involves testing each isolate for antimicrobial activity. These studies will help us understand the relationship of the Honey Locust tree and its fungal symbionts, as well as how these interactions can lead to effective alternative medicines.

P7 Untreated Wastewater as a Source of Bacteria-killing Virus
Grace Palmer
Mentor(s): Dr. James Masuoka, McCoy College of Science, Mathematics & Engineering, biology

Overuse and inappropriate use of antibiotics has led to increased antibiotic resistance in bacteria that cause human disease. Treating disease due to antibiotic-resistant strains contributes to increased healthcare costs and poor clinical outcomes. One alternative to antibiotics is the use of phage - viruses that infect bacteria. The purpose of this study is to determine if bacteria-specific phage is present in local wastewater samples and if isolated phage can infect antibiotic-resistant strains of host bacteria. Untreated wastewater has been shown to harbor bacteria associated with humans. Thus, we hypothesized that wastewater would be a good source of therapeutic phage infecting those bacteria. Escherichia coli is one bacterium abundant in the human intestinal tract, and thus untreated wastewater. Phage that infect E. coli are well studied, so we used E. coli-specific phage to learn phage isolation techniques. Bacteria were incubated in the presence of untreated wastewater. Plaque assays demonstrated that viable phage had been isolated. Plaques are zones of clearing where the virus has destroyed the cells. Phage genomic DNA was isolated and characterized by enzyme digest patterns compared to published phage isolates. Current efforts include attempting to visualize phage structure using electron microscopy and full genomic sequencing. Infection of other strains, including antibiotic-resistant strains, of E. coli by this phage will be tested. We are also currently attempting to isolate phage that infect Staphylococcus aureus, another important human pathogen that has developed resistance to multiple drugs. The results of these studies will provide potentially new tools for fighting antibiotic-resistant bacteria.

P8 Untreated Wastewater as a Source of Virus to Treat Antibiotic-Resistant Bacteria
Mikaela Inderman
Mentor(s): Dr. James Masuoka, McCoy College of Science, Mathematics & Engineering, biology

The addition of antibiotics to modern medicine has significantly improved human health. However, through overuse, many strains of bacteria have grown resistant to antibiotic treatments. This has not only made infections more difficult to treat, but also increased the cost of patient care. In 2018, antibiotic-resistant infections incurred an additional 2.1 billion dollars in costs to the U.S. healthcare system. This has pushed a renewed interest in an old treatment known as phage therapy. Phages are viruses that infect bacteria, often with a high degree of specificity. Untreated wastewater has been shown to contain both human-associated bacteria, such as Escherichia coli, which resides in the intestine, and phage that can infect them. We have successfully isolated a phage to infect and kill E. coli. Spot tests and plaque assays confirmed the
presence of phage. Plaques are cleared zones on a lawn of bacterial growth due to the phage killing the cells. In E. coli, plaques appear as neat, round zones. The repeated evidence of cell clearing across several plates indicates a true phage is present. We have successfully increased phage concentrations and extracted DNA. Current work includes characterizing phage DNA by enzymatic digests, full genome sequencing and imaging phage structure by electron microscopy, and testing phage killing of antibiotic-resistant strains. Further, we are extending our study to look for Staphylococcus aureus-specific phage. Methicillin-resistant S. aureus (MRSA) strains are an increasing healthcare challenge due to many being multi-drug resistant. Through these efforts we hope to increase phage therapeutic options.

**P9 On More Friendly Refrigerants**

*Anna Razavi, Ary Razavi, Andrea Repici*

Mentor(s): Drs. Sheldon Wang, Randal Halford, McCoy College of Science, Mathematics & Engineering, Chemistry, McCoy School of Engineering, (Interdisciplinary 2)

On more friendly refrigerants is a multidisciplinary research effort. The goal is not only to try and identify more environmentally sustainable refrigerants but also thermodynamically efficient ones. Many of the refrigerants in use today have global warming potentials greater than 2000. These refrigerants result in high levels of atmospheric interaction that affect Earth’s climate. Refrigerants are chemical compounds that contain elements with exceptional thermodynamic and chemical properties. However, these gasses have negative effects on the environment. Through the analysis of 27 refrigerants gathered using PSI Plot © to determine the optimal ranges for thermodynamic and physical criteria, along with the implementation of a similar concept from Virginia's Apgar score used in the medical field, an AAARS score was developed as a non-dimensional criterion to determine a numerical value representing the balance between thermodynamic efficiency and environmental sustainability. The AAARS score considers latent heat of vaporization, Joule Thompson coefficient, specific heat at constant pressure, global warming potential (GWP), and ozone depletion potential (ODP). An AAARS score of positive magnitude indicates a viable refrigerant for future use. With the utilization of the Python programming language, the creation of software which will analyze these non-dimensional criteria by the user to automatically output the score for individual use and as well as applications in industry will be made. By making this information more applicable, the intent is to help industries and the public be more aware of typical refrigerants used to implement change in a local sphere.

**P10 Biophysical and Biochemical Characterization of a Familial Mutant of Alpha-Synuclein Protein in Parkinson Disease**

*Viviana James, Isabella Makelaar, Leslie Cook (Graduate Student Mentor),
Mentor(s): Dr. Fu-Cheng Liang, McCoy College of Science, Mathematics & Engineering, chemistry and physics (Interdisciplinary 2)*

Mutations in the alpha-Synuclein gene have recently been discovered in families with an inherited type of Parkinson's disease (PD). The protein alpha-Synuclein (α-Syn) has been linked to pathological lesions in a variety of neurodegenerative disorders. The aberrant accumulation and aggregation of α-Syn in the form of Lewy bodies and Lewy neurites, are hallmarks of PD. A-Syn may play a role in PD pathogenesis in a variety of ways, but it is widely assumed that its
abnormal soluble oligomeric conformations, known as protofibrils, are the toxic species that cause cellular homeostasis and neuronal death by affecting a variety of intracellular targets, including synaptic function. Human wild-type a-Syn and PD-linked mutant a-Syn A30P (Ala30Pro) proteins can self-aggregate and form amyloid-like filaments. It has been shown that the mutant of a-Syn protein A30P generates more mature filaments and beta-sheets than the wild-type protein by the disruption of alpha-helical structure and extend the beta-sheet in the region. A-Syn is an abundant presynaptic protein with uncertain function that has been linked to Parkinson's disease pathophysiology. Here, by using Thioflavin T dye, we obtain the protein aggregation kinetics and show that the A30P mutant of a-Syn aggregates much faster than the wildtype. Additionally, electron microscopy reveals the fibril structure of mutant A30P forms denser/thicker and more fibril-like aggregates than wildtype. These findings suggest that the A30P mutant may have various physiological implications in vivo and may have a role in early-onset Parkinson's disease through alternative mechanisms.

**P11 Membrane Protein Chaperone Affects the Kinetics and Morphology of Amyloid Beta Aggregation.**
Connor Mitchell, Hunter Ordner
Mentor(s): Dr. Fu-Cheng Liang, McCoy College of Science, Mathematics & Engineering; biology and chemistry (Interdisciplinary 2)
Brain degenerative diseases, such as Alzheimer’s Disease (AD), are correlated with protein aggregation caused by the accumulation of misfolded proteins. Amyloid beta (A-Beta) peptides are derived from the cleavage of larger membrane protein molecules and accumulate to form plaques extracellularly around nerve endings. According to the amyloid hypothesis, accumulation of misfolded A-Beta in the brain is primarily responsible for AD. Therefore, the clearing of A-Beta aggregates may provide opportunities for alleviating or treating AD. We show that the novel protein targeting machinery from chloroplast signal recognition particle (cpSRP43) is an effective ATP-independent membrane protein chaperone that can prevent and reverse A-Beta aggregation. Thioflavin T dye determines the kinetics of A-Beta aggregation and shows that the chaperone fractures A-Beta aggregation. Electron microscopy reveals the fibril structure is disrupted in the presence of chaperones. Additionally, titration of chaotropic denaturant like urea into the preformed A-Beta 40 aggregates shows the decrease of light scattering that is consistent with the cpSRP43 titration, suggesting cpSRP43 can actively disrupt the A-Beta 40 aggregates at higher dosage. Our results demonstrate that the presence of cpSRP43 will inhibit or disrupt A-Beta aggregation, potentially opening new avenues to develop an effective treatment for AD.

**Comanch Session IIIA 1:00-2:00: Engineering**

**P12 Desalination Concept Using the Kelvin Dropper Apparatus**
Ernuel Tonge
Mentor(s): Dr. Salim Azzouzz, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering
Approximately 97.4% of earth’s water is in the form of salt water. The continued increase in population growth conjugated with the current climate change crisis brought about
unprecedented very hot periods of time, droughts, floods, and water scarcity in some of the earth most vulnerable regions. These facts led to an increase in demand of desalinated water. The aim of this project is to continue building on the findings of previous EURECA projects, which main tasks were to find a cheaper and efficient way to desalinate water. The last experimenters were able to design an interesting desalination apparatus, which successfully demonstrated that sodium and chlorine ions could be captured by charged insulated electrodes. They tried higher voltages values to capture more ions, but the experiments were not successful due to arcing through the electrodes coating. Based on suggestions from previous research, the current team is exploring the idea of using the Kelvin Water Dropper apparatus to desalinate water. The current EURECA student successfully built a simple version of the apparatus. The first experimentation with the apparatus is encouraging and proved that a stream of water is widening due to the repulsion of the charged water droplets. The student is currently putting together a collecting water system for the purpose to analyze its salt composition. It is expected that the student will be able to analyze the collected samples during the spring semester and to conclude if such system is able to desalinate water or not.

**P13 Experimental Core Flooding Test for Formation Damage during Gel Treatment**

*Jesse Green*

*Mentor(s): Dr. Mahmoud Elsharafi, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering*

In mature oil fields, the success of gel treatment results depends on the ability of the gel to reduce the high permeable formation without damaging to low permeable formation. Formation damage refers to the extent of damage reservoir rocks face from various drilling techniques and/or chemical treatment during well completion. A dynamic filtration test was used to investigate this effect using distinct core samples, brine concentrations and preformed particle gels. The effect of high pressures applied on the particle gels on various core samples with various permeability ranges was determined. These gels were pushed into the core holder with samples and the core permeability change was calculated. Different constant pressures, was used to push the piston behind the gel samples. Then, the gel was flown around the core sample and collected in the outlet container. Various hardware was used to tighten the apparatus and provide connection between brine source, syringe pump, piston accumulator, core holder, and flow outlet container. The damage on the core was evaluated by comparing the original core permeability and the core permeability after gel treatments. Pressure gauges was used to measure the pressure drop across the core samples. The penetration of the particle gels into the low permeable formations can be decreased by the best selection of gel types, particle sizes, and brine concentrations under the reservoir condition. This work results can be used to select the best gel types for the right reservoir condition such as reservoir permeability, and reservoir pressure.

**P14 Optimization of Existing Brine Distribution Unit**

*Anthony Boucher, Andrew Mosley,*

*Mentor(s): Dr. Sheldon Wang, P.E. McCoy College of Science, Mathematics & Engineering; McCoy School of Engineering*

A Brine Unit consists of a dump truck and polyethylene tank containing a saltwater mixture. These
units are used by the state highway department to apply salt water to the bridges and roadways in order to thaw or prevent freezing. The existing units are not well designed and often utilize off the shelve parts for quick repairs. The department of transportation would add modifications benefit greatly from an improved and optimized design. The calculations performed during this project would greatly increase efficiency and thus improve overall roadway safety during winter weather events. The focus of this project is to experimentally and analytically study the minor and major friction losses, pump design, flow distribution mechanisms, and net positive suction head within pump system for both hydraulic fluid and brine solution. We are also studying how to implement PID controller and remote control to create an easier, more efficient user experience. This will be achieved through automatically detecting water lever and controlling of valves and switches. To support the goal of this study, an existing brine unit will be modified to include a new pump design and correctly sized hoses. PID controller, water level sensors, and electronically controlled ball valves will be used to control the flow of brine mixture for application or recirculation. Once the modifications are complete, we plan to test them on a department of transportation vehicle for real world applications.

P15 Experimental & Analytical Studies of Sucker Rod Pump Leakage Issues
Jenifer Campbell, Alex Martinez Roca
Mentor(s): Dr. Sheldon Wang, McCoy College of Science, Mathematics & Engineering; McCoy School of Engineering; Lynn Rowlan and Carrie-Anne Taylor, Echometer Co, Wichita Falls

A sucker rod pump, a reciprocating piston pump, is an artificial lift system which can mechanically lift oil (liquid and gas mixture) out of a well if there is not sufficient bottom-hole pressure. As one of the most widely used artificial lift systems in the oil industry, this pump represents a cost effective and simple way to increase and enhance the oil production. Nevertheless, given the volatility of oil prices, engineers must constantly strive to improve and optimize the efficacy and efficiency of these tried-and-true procedures. The focus of this project is to experimentally and analytically study sucker rod pump leakage issues. The main leakage occurs during the upstroke of a sucker rod pump, when fluid slips through the annulus region between the plunger outside diameter and the barrel inside diameter back into the pump chamber. In addition to better understanding of the nature of the pressure difference and motion, more importantly, to identify the hidden viscoelastic characteristics for such pump systems, both Poiseuille flow due to the pressure difference and Couette flow rate due to the fluid boundary motion will be considered. An existing sucker rod pump model will be modified to include the flexibility to adjust the model orientation from a vertical position to the horizontal position along with a hydraulic hand pump. By incorporating both vertical and horizontal positions, we can then identify the effects of eccentricity. The hydraulic hand pump will be used for pressurizing the hydraulic system when electrical or mechanical power is not feasible.

CSC Atrium Session IIIB 1:00-2:00: Geoscience and Environmental Science

P16 HOW the microplastic-microorganism relationship affects the marine environment
Sherilene Morancie
Mentor(s): Dr Anna Weiss, McCoy College of Science, Mathematics & Engineering, Kimbell School of Geosciences
The use of plastics in our everyday lives has been an increasing trend. Billions of plastic products are used daily around the world. Plastics disposed of in our environment take over 200 years to decompose. But, over these years’ plastics will travel thousands of miles from the land to the oceans and other waterways. Over time extensive plastic material will gradually weather down, forming secondary microplastic fragments. Microplastics are generally understudied compared to larger plastic pollutants, but they are equally or even more dangerous. Microplastics can travel through the food chain, making their way to humans. They can adsorb persistent organic pollutants, which can be toxic. Knowledge is lacking in understanding how microplastics interact with the marine environment and whether certain microorganisms will colonize plastics. Specifically, we will be focusing on the study site, Long beach New York. The microplastics were studied under the scanning electron microscope (SEM) to identify microplastic and possible microorganism populations. Plastics were also scanned using energy-dispersive X-ray spectroscopy (EDS) to determine their elemental composition. The EDS will help us identify and characterize the different types of plastics found in the study area; this will help identify which types of plastic hosts the most microorganisms. We expect to find a host of potential microorganisms such as vibrio and Escherichia coli. Samples will be collected and inventoried monthly to determine whether there are seasonal differences in microorganisms’ concentrations and populations.

**P17 How Microplastics move through Sediments before and after a Natural Disaster**
Shimron St. Clair
Mentor(s): Dr Anna Weiss, McCoy College of Science, Mathematics & Engineering, Kimbell School of Geosciences

Plastics have cemented themselves as important in everyday use. The demand for plastics has increased and has triggered an increase in yearly production. The increase in its production poses a huge problem because these plastics would be deposited in our environments just as fast as they are being produced. This is bad for our environment because plastics can destroy ecosystems and end up in the food chain. It takes approximately 200 years for plastics to biologically degrade thus causing it to remain in the environment for a really long time. The goal of this research is to understand how plastics become deposited in a barrier island environment in Long Beach, NY. From this location samples were selected from different transects on the beach. The samples were examined to determine the angularity and sphericity of the grains. The samples then went on to be sieved to determine grain size. The data collected from this process was logged into a spreadsheet as to calculate the percent passing and percent retained in the sieve. The application R was used with the Geotech package to analyze the data and perform statistical analysis to construct appropriate graphs and average sediment sizes. The sediment qualities are compared with the amount of microplastics retrieved from the samples to see if there are correlations between sediment type and microplastic concentration.

**P18 Quantifying microplastics from beach sediments**
Chelsee Kirk
Mentor(s): Dr Anna Weiss, McCoy College of Science, Mathematics & Engineering, Kimbell School of Geosciences

Plastic production started in the 1940’s and the demand for plastics have increased ever since.
With this increase, microplastic pollution has become an ongoing crisis in marine environments all around the globe, especially due to improper management of waste produced from these products. There are also a lot of unknown factors that play a role in microplastic pollution that are currently being researched. These factors include microplastic deposition, quantity, and assessment of the sources from which plastic comes from. In an effort to learn more about microplastics, our research team is quantifying the amount of microplastics in an urban barrier island environment. Samples were taken from this environment and are being separated by filtering the sediment from the microplastics. Once each sample has been correctly filtered, the use of a compound microscope helps in the process of identifying and counting the many types of plastics encountered. Every sample so far has had identifiable plastics within them, in many different forms including different colors, shapes, beads, filaments and fragments. The recognition and quantification of microplastics is one of the many steps taken, so that we can eventually find a correlation between different sediment types with seasons and specific times of year. These research findings are increasingly important, with the ever-growing number of microplastics found in marine environments around the world.

**P19 Examination of the Paleocene-Eocene boundary using SEM-EDS**

*Kathryn Brown*

Mentor(s): Dr. Anna Weiss, McCoy College of Science, Mathematics & Engineering, Kimbell School of Geosciences

The Paleocene-Eocene Thermal Maximum, or the PETM, was a period of sudden warm temperatures that occurred approximately 56 Ma. Studying this time can give incredible insight into the rapid heating the Earth is experiencing in the present and how past ecosystems respond to it. However, before exploring how the ecosystem responded, the ecosystem's conditions need to be addressed. In one section in Slovenia, a major question exists – what caused dissolution at the Paleocene-Eocene boundary: ocean acidification or subaerial exposure? The answer has major paleoenvironmental and paleoclimatic implications. To answer this question, the Scanning Electron Microscope - Energy-Dispersive X-ray Spectrometer, or SEM-EDS, was used to study thin sections of the boundary. The results determined that the sedimentation occurred mainly in underwater environments, supporting the acidification hypothesis. The information gained from this experiment will make it easier to set the scene and help with future studies on the PETM.

**P20 COVID-19 Pandemic and Tone Manipulation in Financial Reporting**

*Galesha Henry, Nickisha Richard*

Mentor(s): Dr. Lin Wang, Dillard College of Business Administration, accounting,

COVID-19 was declared a global pandemic on March 11th, 2020, by the World Health Organization (WHO). Companies were financially impacted by the pandemic as governments across the globe-imposed restrictions, such as lockdowns and quarantine, which significantly reduced operations and sales. Despite a drastic decline in economic activities, managers are still required to be honest and fully disclose the good and the ugly regarding the financial position of their companies, including the consequences of COVID-19. This project aims to analyze the financial information presented in the annual reports of the 30 companies in the Dow Jones
Industrial Average (DJIA) to uncover the answers to an important question: Whether and how does the COVID-19 pandemic affect managers’ tone manipulation in financial reporting? The primary methods used to carry out this research will be textual analysis and ordinary least square regression (OLS) analysis. Textual analysis was applied to determine the tone in the Management Discussion & Analysis section of quarterly and annual reports. The tone measure was calculated based on a dictionary, which was applied to the MD&A text using python. Tone measure was then merged with the financial data. We compare how tone is associated with future earnings before versus after COVID-19. A positive coefficient of tone supports the argument that managers’ tone conveys private information to the market on future performance. If the coefficient is more positive after COVID-19, it suggests that managers reveal more information through tone to reduce the information asymmetry created by COVID.

P21 The Rhetoric of Social Media
Shelby Watkins
Mentor(s): Dr. Hillary Coenen, Prothro-Yeager College of Humanities & Social Sciences; English

Social media and digital culture have bled into many aspects of our lives today, including our democracy. Rhetoric can be defined as a “means of persuasion,” and it is through that lens that this project describes and analyzes social media (specifically Facebook) and algorithms, how they work, and how they are rhetorical. These operations are used as means of persuasion that polarize users politically and can be analyzed using the canons of rhetoric. This project is a rhetorical analysis and synthesis of the effects of social media in democracy based on articles about and why social media is so effective at persuading its users. Because algorithms are designed to respond to an individual’s likes, pages they follow, and other online interactions, how the audience interacts with the internet is crucial to how algorithms and recommendations target users specifically. Initial findings show that surveillance capitalism plays a large role in the motivation of the social media giants’ motivations behind using these technologies to persuade their audiences. The rhetoric of social media within our culture is extremely powerful and has a ripple effect that impacts our lives in one of the most dangerous ways—our democracy.

P22 The Design and Development of an Effective Digital Mathematics Game
Micah-Lyn Scotland, Brittney Clarke
Mentor(s) Dr. Catherine Stringfellow, Dr. Dittika Gupta, McCoy College of Science, Mathematics & Engineering, Computer Science; West College of Education, Curriculum & Learning (Interdisciplinary 3)

There is a need for digital applications to teach mathematical concepts to children that meet certain important criteria, as identified in an earlier study. The criteria include corrective feedback, engagement, and creativity. This project involves an interdisciplinary team of students and professors from Education and Computer Science to design and implement a prototype to describe 5th grade math concepts. The concepts include: (1) measurements associated with geometric shapes (perimeter, area, circumference, volume) and (2) simple fractions and percentages. The application will provide feedback indicating if the student response was correct or incorrect. If incorrect, students will be given an explanation and another attempt. This application will use animations that include candies, pizza, and measuring cups to create an
engaging experience for a 5th grade student. The student will have the option to choose between a beginner and an advanced level. The team developing the project will use Godot for software development, Git and GitHub for version control, and Trello for project management. The project will initially be a stand-alone application on a personal computer (PC) running a Windows system. The process involves creating the statement of scope, listing the major requirements and constraints, as well as the designing the graphical user interface. These preliminary interim artifacts will be presented, and a demonstration of the application working to date will be given. In conclusion, correlations between the application’s features to the educational criteria will be described. Future goals would involve implementing the program on tablets and mobile devices for easy use.

**CA2 Promoting Positive Attitudes Towards Disabilities: Developing an Inclusive Literature Curriculum.**
*Shaddel Lewis, Brittney Clarke*
Mentor(s): Dr. Emily Smith, West College of Education, special education

Disability awareness refers to educating society about disabilities and how we, as individuals, may help to make required changes. Acceptance is the cornerstone of a well-informed disability awareness approach, and as a result researcher sought to educate others about various disabilities that exist in contemporary society, which will inevitably aid in the alleviation of society's stereotypical thinking, allowing everyone to do their part in the development of a positive and inclusive society. This creative endeavor intends to create a curriculum that will aid teachers in incorporating inclusion literature into their elementary classrooms. Authors have used children's books to teach about a variety of impairments, producing a large variety of inclusion literature; however, there is insufficient information accessible to aid teachers in the incorporation of such material into their classrooms. The researchers’ goal was to raise awareness, knowledge, and understanding among their audience by shedding light on various disabilities. Therefore, 40 books were chosen that showcase a variety of disabilities and a curriculum was developed that includes readily available lessons focusing on specially using children's literature to teach elementary students about disabilities. A well-rounded, resourceful website was established to be used as a valuable tool for elementary school teachers.

**Undergraduate Emerging Research Poster Presentations**

**CSC Atrium Session I 3:00-3:45: History, World Languages, and Education**

**ER1 Lao Voice in U.S.-Lao Relations during the Cold War**
*Rachel Patterson*
Mentor(s): Drs. Mike Rattanasengchanh and Eric Lynch, Prothro-Yeager College of Humanities & Social Sciences; World History and World Languages

During the Cold War, Laos wanted to remain neutral but was pressured by both communists and the United States to act. It is the purpose of this project to understand why Laos shifted from a state of neutrality to falling under communist rule and both communist and the United States
governments as well as from their own government compromised their efforts for neutrality by war efforts. In 1962, Laos along with the superpowers agreed to make a neutral country, making sure Laos was neither a communist nor non-communist country. Their neutrality did not last long, and Laos fell into a civil war with different political groups fighting for power, which eventually led to Laos becoming a communist country. The Lao Presse is a French-language newspaper based in Laos that existed in the country before their eventual move to communism. We will be utilizing this newspaper to understand how the Lao people felt about both United States and communist intervention, as well as understanding the relations between the different governments and how the country eventually shifted to communism in the wake of the Lao civil war.

**ER2 What is the dominant personality trait of college faculty?**

Shawnisay Millar

Mentor(s): Dr. Carrie Taylor, Dr. Sandra Shawver, Dr. Tim Hinchman, West College of Education, Kinesiology

The purpose of this study is to determine the most dominant personality trait of the faculty within a mid-size liberal arts college in North Texas. The generally accepted perception is that temperament is an individual's unique way of reacting to experiences inclusive of how one approaches daily responsibilities and tasks (Mullola et al, 2014). The way in which a teacher interacts with their students may impact student performance and teacher expectations (Kumar & Lighter, 2007). Thus, the researchers will strive to identify the differences in faculty personality traits by subject area(s) taught and compare these results across the different departments within the college as a whole. The importance of this study is that after identifying the personality traits of faculty, the information will be shared so as to provide an opportunity for self-reflection that may lead to adjustments in how individual faculty connect with students while presenting their specific course curriculum. We will investigate the correlation between Melancholic, Choleric, Phlegmatic, and Sanguine temperament traits using t-test analysis. Once the consent has been submitted, each participant will be provided a personality profile to be completed and the demographic/teaching responsibility form. A comparison of the four temperament styles will be conducted relative to the participants' teaching area, and level of instruction. The central research question of this study examines if there is a statistical difference between the four personality traits, and the instructors/professors teaching in their designated curricula.
Undergraduate Student Virtual Presentations

Live Table Sessions on Symposium by ForagerOne: Thursday 4/21 from 3:00-4:00

**Presenters have been assigned a “Live Session” in which they will meet with the evaluators for Q&A session. We have provided Table Session Instructions if you would like to join a discussion.**

**OV1 False Consciousness, Racial Prejudice and Group Threat in the Immediate Post-Trump Era**

Isabella Black  
Mentor(s): Dr. Isaac Christiansen, Prothro-Yeager College of Humanities & Social Sciences; Sociology  

At a time of a seemingly volatile, polarizing political landscape following the presidency of Donald J. Trump, it is imperative for social scientists to grasp this phenomenon and its social impact. We conduct a quantitative survey analysis of students at a Southwestern university in the U.S. and ask, “which factors increased the odds of students voting for Donald Trump in the 2020 election cycle?”. Running a logistic regression analysis, these data suggest that students who indicated high religiosity, high affinity for militaristic ideology and low belief in climate change and COVID-19 science on their survey had greater odds of voting for Donald Trump the 2020 election cycle. This presentation will explore the relationships and draw attention to the failure of the social-distance scale used in the survey (Bogardus, 1924). IRB#21060801

**P V1 - Evolution of Payor Systems in Healthcare**

Mickel Aikens  
Mentor(s): Dr. Emily Reeves, Dr. Leann Curry, Dr. Janise McIntyre, West College of Education, Undergraduate Education  

Payors are organizations that set service rates, collect payments, process, and pay claims (Collective Medical, 2020). Unlike the providers who offer medical services such as hospitals, they provide payments for the services. Payors are generally classified into two broad categories; single-payer and multi-payer systems (Donnelly et al., 2019). Single payers’ systems are financed by a single entity, which is often the government. Here, the government pays for medical services financed through taxation. Multiple payor systems are financed by more than one entity, which includes the government and private health insurance companies. Financing is done through premiums paid by beneficiaries, employers and even the government. The United States displays a complex hybrid of payor systems (Donnelly et al., 2019). The major public providers include Medicare which provides universal health care for people over 65 years and older (Medicare.gov, 2021). Medicaid provides health care coverage to disadvantaged groups like low-income families, people with disabilities, and the blind (Medicaid.gov, 2021). The major private providers include entities like UnitedHealth Group, Anthem, Aetna, Cigna, and Humana (Collective Medical, 2020). This research seeks to map the United States healthcare system by tracking four possible scenarios through bypass surgery including the initial doctor appointment and testing. Out of pocket expenses demonstrate the staggering difference in those who have commercial insurance, Medicare only, Medicare HMO, and those who are self-pay. This model will form the basis for subsequent evaluation of interventions in payment transparency.
**OV2 Robust Improvements of an existing Drilling and Reaming Kawasaki RS005L Robot Work Cell.**

Cameron Calhoun, Quentin Scharfenberg

Mentor(s): Dr. Jan Brink, McCoy College of Science, Mathematics & Engineering, McCoy School of Engineering

Efforts to increase productivity and efficiency in manufacturing industries have been expanding year after year. Robotic technology has been widely incorporated into manufacturing for decades. The purpose of an automatic clamping, drilling, reaming, and inspection station is to demonstrate the robustness, efficiency, and reliability of a fully automated operation to students, faculty and staff, and other individuals. The equipment used in this project includes a Kawasaki RS005L robotic arm, sensors, a material handling system, and a Cognex 7801 Vision System. A vision inspection language and a high-level robotics language will be studied. For this research, wooden blocks of similar size will be loaded onto a pallet by an operator that will be transported using an air bearing system, where they will be automatically depalletized and placed into a hopper system. These blocks will then be fed into the drilling/reaming operation and clamped one-by-one against an aluminum wall. The block will then be drilled through and reamed to provide a smooth internal surface of the drilled hole before it is transported by the robotic arm to an area to be inspected using the vision system. The vision system will then decide if the block is deemed to be good. Various sensors will be used as indication points to automate the processes.
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*The Wichitan*