



UNIVERSITY of
LOUISIANA
L A F A Y E T T E

Honors Program
presents the

***11th Annual Fall Undergraduate
Research Invitational***

**Friday November 16th & Saturday November 17th, 2018
Atchafalaya Ballroom of the Student Union
UNIVERSITY OF LOUISIANA AT LAFAYETTE**

Participating Schools:

Dillard University
McNeese State University
Nicholls State University
Northwestern State University
Southeastern Louisiana University
University of Louisiana at Lafayette
University of New Orleans

This conference is brought to you with the support of the
University Honors Program
Office of the Vice-President for Research
LaCOEUR
College of Liberal Arts
College of Sciences
College of Engineering

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Acknowledgements

I would like to take the opportunity to thank a number of people who made this possible. No undertaking this large is ever created by one person. The thanks go to Dr. Ramesh Kolluru, Vice President for Research, Innovation, and Economic Development, Dr. Terrence Chambers and the Undergraduate Research Committee, without whose help this would never had happened. Thanks to the staff at Honors, Mr. Ryan Winters, Mrs. Renauda Helaire, Professor Mary Ellen Stegall, and Mr. Jason Suire for their continuous support and service to this project. Thank you also to Dean Bobbie DeCuir, Dean Jordan Kellman, Dean Ahzmi Ackleh, and Dean Mark Zappi for their personal and financial support of this project. Additional thanks to the faculty for their tireless efforts in helping and encouraging students to pursue undergraduate research. We also appreciate the directors and staff at the UL Lafayette Student Union for graciously making their buildings available to us. Lastly, I wish to acknowledge all the time and energy that the students who attend this conference expend to create their work and to come to Lafayette to share it.

About the University of Louisiana at Lafayette

Founded in 1900, the University of Louisiana at Lafayette (then the Southwestern Louisiana Industrial Institute, the largest member of the University of Louisiana System, is a public institution of higher education offering Bachelor's, Master's, and Doctoral degrees. Within the Carnegie classification, UL Lafayette is designated as a research university with high research activity. The University's academic programs are administered by the Colleges of Arts, Education, Engineering, General Studies, Liberal Arts, Nursing & Allied Health Professions, Sciences, the B.I. Moody III College of Business Administration, and Graduate School.

The University is dedicated to achieving excellence in undergraduate and graduate education, in research, and in public service. For undergraduate education, this commitment implies a fundamental subscription to general education, rooted in the primacy of the traditional liberal arts and sciences as the core around which all curricula are developed. The graduate programs seek to develop scholars who will variously advance knowledge, cultivate aesthetic sensibility, and improve the material conditions of humankind. The University reaffirms its historic commitment to diversity and integration.

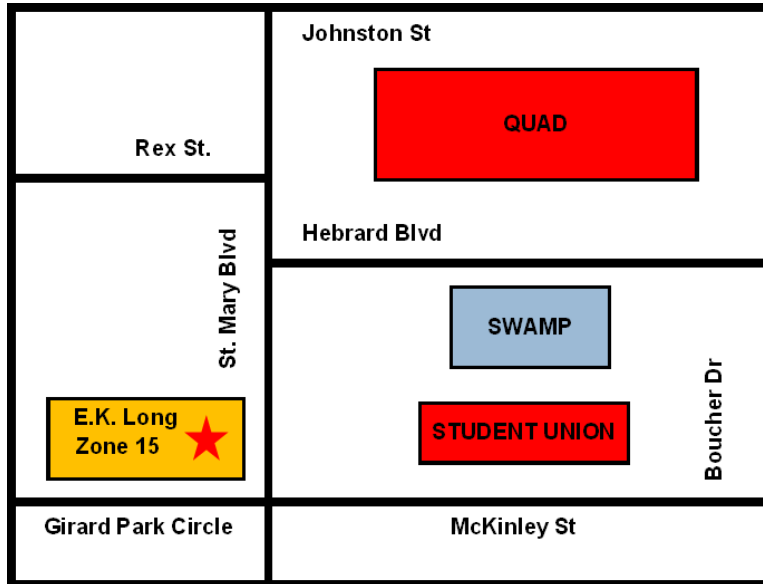
Thus, through instruction, research, and service, the University of Louisiana at Lafayette promotes regional economic and cultural development, explores solutions to national and world issues, and advances its reputation among its peers.

About the University Honors Program

The Honors Program at the University of Louisiana at Lafayette provides serious and highly motivated undergraduate students with an enhanced set of educational opportunities so that those students who seek added dimension, enrichment, and challenge in their studies may find realization of their potential. In a society where Honors programs are short-lived and superior education is no longer highly valued, UL Lafayette stands proud as one of the earliest established programs of its kind in Louisiana.

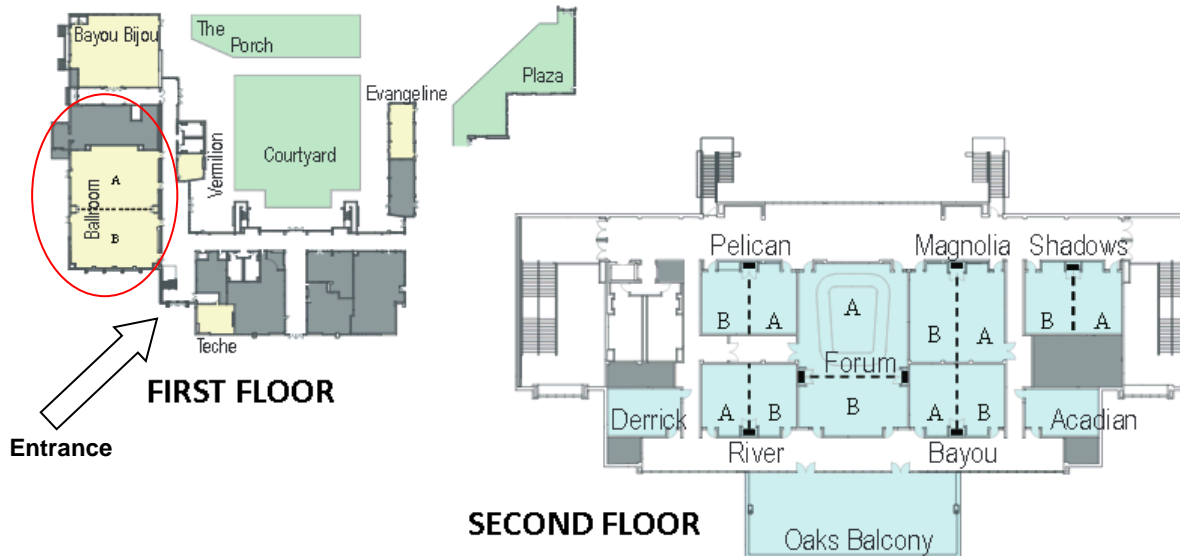
With over 1,500 students, the UL Lafayette Honors Program, one of the largest in the state, is an active member of the Louisiana, Southern Regional, and National Honors Councils. We are known nationwide as leaders in collegiate Honors education. The program is based on the philosophy *per sapientiam felicitas* – “through knowledge, happiness”.

Parking Information



Parking has been reserved for conference participants and attendees in Zone 15 (E.K. Long) located at the corner of Girard Park Circle and St. Mary Blvd.

Student Union Information



Guest Speaker



Mr. Richard E. Stegall

Executive Director

Miles Perret Cancer Services

"New Research Possibilities with Miles Perret"

Richard Stegall is a graduate of Louisiana State University, where he majored in Business Administration with a concentration in Industrial Management. Prior to joining Miles Perret Cancer Services (MPCS), Stegall worked in the oil and gas industry for over three decades. For the majority of his career, he was employed by Cameron International, now a division of Schlumberger Limited. With a base discipline in Manufacturing and Operation Management, he has performed various roles from production and inventory control planner to director of operations as well as division president.

Presently, Richard Stegall serves as the Executive Director of the Miles Perret Cancer Services (MPCS) Organization. His job duties include overseeing all aspects of the operations of MPCS. These include client relations and program management, staffing, budget, fundraising, volunteers, I.T., contracts, and community relations. Additionally, he ensures the goals and directives of the MPCS board of directors are met and that their policies are implemented.

University of Louisiana Lafayette Honors Program Undergraduate Research Invitational Fall 2018

Dillard University
McNeese State University
Nicholls State University
Northwestern State University
Southeastern Louisiana University
University of Louisiana at Lafayette
University of New Orleans

Friday, November 16th

**All Conference Rooms are in the Student Union*

5:00 pm – 6:00 pm	Arrival and Conference Check-in *Hallway Outside Atchafalaya Ballroom
6:00 pm – 7:00 pm	Banquet *Atchafalaya Ballroom
7:00 pm – 7:30 pm	Keynote Speaker *Atchafalaya Ballroom
7:30 pm – 9:30 pm	Poster Session *Magnolia Room—Psychology, Social Science, History *Pelican Room—Chemical Engineering *River Room—Engineering, Industrial Design *Shadows Room—Sciences, Kinesiology, Computer Science, Business, Allied Health

Saturday, November 17th

7:00am – 8:30am	Breakfast (Hotel Guests Only) – Hotel Restaurant
8:30am – 9:45am	First Oral Session *Breakout Rooms 1-3 See Program
10:00am – 11:15am	Second Oral Session *Breakout Rooms 1-3
11:30am – 12:45pm	Lunch *Atchafalaya Ballroom
1:00pm – 2:15pm	Third Oral Session *Breakout Rooms 1-3

Poster Presentations
Friday, November 16th, 2018 7:30-9:30pm
Listed Alphabetically by Title

3D Pore Scale Modeling in COMSOL of Superhydrophobic Coated Proppant

Presenter: Philip Wortman

Area of Study: Petroleum Engineering

Advisor/Secondary Author: Dr. Mehdi Mokhtari

School: University of Louisiana at Lafayette

Abstract:

"Alteration of the wettability of proppant and rock face changes the permeability of porous media in both single and multiphase flow. Superhydrophobic coatings change the wettability of materials through nanoscale roughness and chemical application. Theoretically, flow through superhydrophobic material could produce higher liquid flow rates with less pressure requirements. COMSOL Multiphysics was used to simulate 3D and 2D pore spaces in laminar and turbulent flow with changes to the slip condition along wall structures. Simple structures such as straight piping and proppant packs were used to simulate and analytically support the proposition of increased permeability of treated material with single phase fluid flow."

3D Printing Applications in Metal Casting

Presenter: Hunter Ayo, Madison Rolig, Sarah Simon, and Victoria Toups

Area of Study: Visual Arts & Industrial Design

Advisor/Secondary Author: Emily Stergar, Daniel DiCaprio, Adam Feld

School: University of Louisiana at Lafayette

Abstract:

This project researched 3D printing applications for metal casting. Six students, under the guidance of three professors from Metalwork and Jewelry, Industrial Design, and Sculpture, worked collaboratively to design a work of art utilizing methods from each of our concentrations. Our goal was to create 3D printed objects that were then cast in aluminum using a lost-wax investment process. The final piece combines these forms with natural found objects to create a hybrid sculpture discussing the relationship of the built world with the natural.

A Life Cycle Assessment on the Production of Hydrogen from the Reformation of Biogas

Presenter: Samantha Bonilla

Area of Study: Chemical Engineering

Advisor/Secondary Author: Remil Aguda and Dr. Emmanuel Revellame

School: University of Louisiana at Lafayette

Abstract:

"Hydrogen produced from the reformation of biogas was evaluated as an alternative source of energy for its impact to the environment by life cycle assessment (LCA). The LCA results of the study show that the significant environmental impact from this process technology fell under global warming potential (GWP). This result was compared with similar bioenergy studies and showed that the system investigated produced the lowest GWP.

Having a quantified environmental impact of hydrogen production be measured with LCA methodology is advantageous for quantitative analysis at each phase to improve the system. As such, the LCA indicates where the highest energy demand during the life cycle of hydrogen is dominated by, which subprocess the environmental impacts are most influenced by, and how sustainable is the case study in comparison to other systems. With this, improvements in the process technology for minimizing undesirable by-products and maximizing hydrogen production can be determined."

Adjustable UV Light Source for Digital Light Projection Stereolithography

Presenter: Jacob Comeaux

Area of Study: Mechanical Engineering/Biomedical Engineering

Advisor/Secondary Author: Charles Taylor, John Thomas Frank, Brittany Albarado, Tyler Graves

School: University of Louisiana at Lafayette

Abstract:

The premise of this project was to upgrade the light source of a DLP printer to a UV source more suitable for curing 3D printing resins. This involved replacing the preexisting DLP projector light housing with a housing capable of holding the new UV source and focusing it into the light tunnel of the projector. The UV source chosen was a 10 watt, 365 nanometer wavelength UV LED chip. A housing incorporating a light-lens rail system was designed using CAD software and fabricated using waterjet cutting and 3D printing. This light-lens rail system provided a versatile solution enabling optics and source elements to be interchanged and repositioned for this novel design. This allowed for the mounting of a white LED that was then used to determine the position of the light and lens brackets prior to installing the UV LED. A biconvex lens was chosen to focus the UV LED's diverging rays down to a focal point allowing a maximum amount of UV energy into the light tunnel. Because of the emitting UV rays from the printer, a case was needed to block these rays from the surrounding. This was achieved through the designing and fabrication of a UV protectant neon acrylic case. The goal of this printer is to produce models of the cardiovascular system for benchtop flow studies; long arterial networks with fine details. The new UV source provides a cost-efficient solution to increasing print quality of parts as well as accelerating cure time of resins.

Alternate Personas in Fantasy Roleplaying Games as either an Extension of the Self or a Reflection of the Ideal Self

Presenter: William Curth

Area of Study: Psychology

Advisor/Secondary Author: Dr. Gary Rosenthal

School: Nicholls State University

Abstract:

When playing Fantasy Roleplaying Games (FRPGs), people create alternate personas. Past researchers such as Park and Henley believe that role players create alternate personas that act as an extension of the Self. This means that an alternate persona is similar to the original role player. Other researchers, such as Bessiere, Seay, and Kiesler, believe the opposite, that role players create personas that are the opposite themselves, instead serving as a reflection of their Ideal Self. The purpose of this study is to discover if both ideas are compatible. Thirty-one role players took a survey to determine the level of similarity between themselves and their character and filled out two copies of the Mini-IPIP personality test, once as themselves, and once as their character. This study investigates the process of making alternate personas for roleplaying in the context of the persona's level of similarity to a role player.

Analysis of dietary offerings for inmates at three correctional facilities in Louisiana

Presenter: Kristen Waguespack

Area of Study: Dietetics & Allied Health

Advisor/Secondary Author: Dr. Brigett Landry Scott

School: Nicholls State University

Abstract:

Louisiana is known for its highest per capita prison population nationwide. For every 100,000 people there are 762 prisoners. In 2015, the US spent \$8.1 billion on inmate healthcare. Correctional facility food service employees are faced with the challenge of meeting the nutritional requirements of inmates while relying on \$3 an inmate per day food budget. A pilot study was performed examining three Louisiana correctional facilities to analyze the composition of meals being served to inmates. It was hypothesized that meals would be adequate in calories to meet the needs of healthy inmates, but not the nutritional needs of inmates with special diets. This study utilized the hedonic scale in order to rate the acceptance of inmate meals and a questionnaire with the facility's registered dietitian or kitchen staff in order to gather information on meal analysis and the facility. Although correctional facilities are provided with meal patterns to follow, menus vary and there are no checks and balances to make sure kitchen staff are complying with meal patterns. This pilot study gives a healthful insight as to why correctional facilities should be concerned with the nutrition of their inmates and proves the evidence that inmates receive less of the healthy foods and excess of grains, cholesterol, sugar, and sodium, which are known to cause major health issues if not eaten in moderation. This can lead to increase healthcare costs within the prison systems.

These results were observed in three Louisiana correction facilities where the quantity of food was excessive, and quality was lacking. Even though inmates are served more food than the USDA recommends, they are being served more fat, sugar, sodium, and cholesterol and less fruits and vegetables. If more healthful and moderate menus were enforced this could lead to less chronic disease and decrease medical costs.

Biomass Gasification: Catalytic Tar Removal Using Nickel Ceramic Filter

Presenter: Derrick Jenkins

Area of Study: Chemical Engineering

School: University of Louisiana at Lafayette

Abstract:

Due to the volatility of the fossil fuel market and other nonrenewable energy sources, there has been a focus on research into sustainable energy sources. There have been great strides over recent years to shift the world of energy into more renewable processes such as biomass conversion. One of the current processes that is used for the conversion of biomass to energy is gasification. This entails the reaction of biomass, such as pine wood, pecan shells, or bagasse, under limited oxygen at high temperatures (>700 oC) to produce syngas. Syngas is primarily composed of hydrogen, carbon monoxide, and carbon dioxide, which can be converted to various forms of energy and fuels. In addition to syngas, undesired products such as tars and particulates are generated during the process. Tar condenses and causes clogging/plugging, corrosion, etc., in downstream process equipment, which prevents efficient conversion of biomass into energy, a major hurdle in gasification commercialization. The goal of the present study is to reform the tar in the most cost effective manner to increase the conversion into syngas. Thus, this study focuses on developing a steam reforming catalytic ceramic filter that can remove tars and particulates. Ceramic high temperature filter is impregnated with nickel for the purpose of process intensification, combining the particulate filtration and tar removal into a single unit. Nickel ceramic filter developed has a BET surface area of 90 m² /g and an average pore size of 77 Å. An experimental system unit has been designed and set up to accommodate tar removal studies using the filter developed. Naphthalene will be used as a model tar compound, since it is the most stable compound among tars. Shake down testing of the experimental set up has been performed till date, the data from which will be presented.

Blind Navigation Using Neural Networks

Presenter: Jeremy Desforges and Madison Viator

Area of Study: Electrical Engineering

Advisor/Secondary Author: Mohammad R. Madani, Ph.D.

School: University of Louisiana at Lafayette

Abstract:

In this extended abstract, we outline all of the tasks that will be accomplished by the members of the University of Louisiana at Lafayette (UL) Senior Design Project 4: Blind Navigation Using Neural Networks. This project is a neural network based system that uses a smartphone camera and GPS system to assist visually impaired students in traversing across the UL Lafayette campus. The convolutional neural network will be trained in real-time detection of

objects that a student would encounter while crossing a college campus. Once this network is implemented on the smartphone, the student will be able to use the smartphone's camera to recognize obstacles and deliver audio feedback for alternative paths. This system will also use a magnetometer to determine which direction the user is facing, a predetermined path using the Google Maps API, and GPS coordinates to determine how to safely advance the user towards the desired destination. This will allow the student to move from building to building efficiently and effectively.

Community and Social Support of Second- Generation Immigrants in the US

Presenter: Zachary Boudreaux

Area of Study: Psychology

Advisor/Secondary Author: Dr. Manyu Li, Donaka Autry, Andre Rodriguez

School: Nicholls State University

Abstract:

Immigrants and their children often report difficulties in sociocultural adaptation, partly due to the cultural distance they experienced between their cultures of origin and the host country cultures (e.g. Bierwiazzonek & Waldzus, 2016; Searle & Ward, 1990; Shenkar, 2001; Ward & Kennedy, 1993). This study aimed at identifying second-generation immigrants' source of social and community support, as well as their involvement in social and community organizations. The interview data in this study were part of a larger project examining immigrants' sociocultural adaptation and community engagement. The participant was interviewed by a well-trained researcher. At the beginning of the interview, the researcher made sure that the participants identified as immigrants. If the student stated that he/she did not identify as an immigrant, the student was informed that he/she did not fit the inclusion criteria for this study. The results of this experiment produced several themes generated throughout each second-generation immigrant; these themes were that each participant received social support from their family members and peers, along with extended social support from affiliating organizations in the area and strangers that may come from a similar background as the participant. However, regarding if the participant was interested in helping the immigrant community, the answer was always a resounding "yes", but they were unsure of how to approach the idea. They hadn't found ways or time to go about helping immigrants similar to themselves in the community. This small study only further pushes cross-cultural research forward in regard to second-generation immigrants, along with the aspects of their life and how they wish to impact others that come after them. America used to be known as a nation of immigrants, but after several centuries we have accomplished our own culture; however, we seemed to have lost touch with how to assist immigrants of today.

Community Engagement of African American Students

Presenter: Donaka Autry

Area of Study: Psychology

Advisor/Secondary Author: Dr. Manyu Li

School: University of Louisiana at Lafayette

Abstract:

This research studied the relations between students' community engagement and racial identities and their need to help those who share their culture. Four-hundred-and-twenty-six students, 110 African Americans and 316 Caucasians, participated in this study. The Li and Frieze (2016) community engagement scale was used to study general community engagement intention (i.e. both engagement in American and heritage culture), community engagement intention in heritage culture, and community engagement intention in American culture. The need to help families/friends/strangers from heritage culture was measured using six items to measure participants' perceived demand and desire to help families, friends and strangers from their heritage cultures. Results showed that the two racial groups (African Americans vs. Caucasians) were only different on their community engagement intention in cultural heritage groups. The two groups were not different in general community engagement. The results also indicated a positive correlation between African Americans' general community engagement intention and their perceived need to help their culture.

Condom Availability and Safe Sex Behaviors

Presenter: Haven Evans-Nezat, Kelsey Mayes, Mia Comeaux

Area of Study: Psychology

Advisor/Secondary Author: Amy Brown

School: University of Louisiana at Lafayette

Abstract:

In order to understand why college students would not use protection and to produce interventions that will increase condom use and decrease risk for STDs, according to previous literature, we must begin by understanding the correlations among college students' attitudes toward, perceived norms about, and behavioral intentions to use condoms. In this study, we administered a survey that included a Sexual History Survey, Condom Use History Survey, and Condom Use Attitudes Survey, along with a demographics survey. Our population was students who live in either of two UL Lafayette residence halls. The demographics of the 283 participants we explored concerning condom use intentions were gender (the majority were females), sexual orientation (the majority were heterosexual), and sexual experience. The data presented here were results from a preliminary survey that was part of a larger intervention on condom availability and condom attitudes and behaviors. Our predictions were supported by our findings. Attitudes toward and perceived norms about prophylactic use were significant predictors of behavioral intentions to use condoms, and this finding was significant regardless of gender, sexual orientation, or sexual experience of participants.

Correlation of Block Design Task Proficiency and Dorsal Pathway White Matter Integrity in Adolescents with Autism Spectrum Disorder

Presenter: Jade E Jenkins

Area of Study: Neuroscience/Psychology

Advisor/Secondary Author: Tracy A. Knaus

School: University of New Orleans

Abstract:

Superior performance on block design tasks, an assessment of visuospatial abilities, has been reported in individuals with Autism Spectrum Disorder (ASD). This proficiency supports the weak central coherence theory (WCC) as a feature of information processing in ASD. The visual dorsal pathway, commonly referred to as the “where” pathway, is thought to be used to recognize where objects are in space. The purpose of this study was to determine whether proficiencies in the block design tasks correlated with white matter integrity of the dorsal pathway and with volume of the lateral occipital and superior parietal lobes, critical regions of the dorsal pathway. Twelve right-handed boys with ASD (mean age=14.0, SD=1.6) and 12 typically developing right-handed boys (mean age=13.6, SD=1.5), 12-16 years old, completed the WISC-III and MRI and DTI scans to evaluate the integrity of the dorsal pathway. We hypothesized that block design performance would be better in the ASD group than in controls. We also predicted that better block design performance would be associated with stronger connectivity of the dorsal pathway and greater volume in the lateral occipital and superior parietal lobes, particularly in the right hemisphere. Results are pending final analysis.

Cross-Linking of Chitin Nanowhiskers for Use in Biomedical Research

Presenter: Caleb Chauhan

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. Depan, Melanie Sanders

School: University of Louisiana at Lafayette

Abstract:

Chitin, next to cellulose, is the most abundant biopolymer found in nature. In recent years, its potential applications in several fields of research have been extensively studied for many reasons. It can be utilized as a waste product, since it is readily found as one of the main constituents in crustacean shells, making it very eco-friendly and inexpensive to manufacture. However, chitin’s use is limited due to its low solubility in organic solvents; so it is often modified to more practical structures, including chitosan and chitin nanowhiskers. This discussion focuses on one promising application for chitin nanowhiskers for use in the improvement of the mechanical properties of scaffolds. Fourier transform infra-red (FTIR) analysis was performed on pure chitin and chitin nanowhiskers to verify that the two were identical; and scanning electron microscopy (SEM) images were taken to show the difference between each, in terms in size and geometry. To determine the extent of cross-linking, these images were then compared to an FTIR analysis of the cross-linked nanowhiskers. In addition, SEM photos were taken of the chitosan-chitin nanowhisiker scaffolds and of pure chitosan scaffolds to evaluate any difference in pore size, shape, and distribution.

Cultural and Ethnic Identity Conflicts Experienced by Ethnic Minority Immigrants in the US

Presenter: Joshua Dupuis

Area of Study: Psychology

Advisor/Secondary Author: Dr. Manyu Li, Andre Rodriguez, Donaka Autry

School: University of Louisiana at Lafayette

Abstract:

This interview study aimed at understanding first and second-generation immigrants' cultural conflicts and how they resolve it. Previous studies found that immigrants and their children experience cultural conflicts, as these individuals often experience bicultural or bi-ethnic identities. Fifteen participants were recruited through UL Lafayette SONA participant pool in the Psychology Department. Only participants who identified themselves as immigrants were invited. A deductive content analysis approach was used to analyze the interview transcriptions. Participants' experiences of their presence or absence of cultural conflicts, and their barriers to heritage or host cultures were summarized. Although most participants, especially first generation immigrants, expressed that they experienced cultural conflicts and how they sometimes disliked local cultures, some participants did not experience any cultural conflicts. Reasons such as light skin tone or strong appreciation of the host culture were cited by immigrants who did not experience cultural conflicts.

Dead Wood Survey of an Assimilation Wetland

Presenter: Holly Mayeux

Area of Study: Biology

Advisor/Secondary Author: Dr. James Nelson, Skylar Flaska

School: University of Louisiana at Lafayette

Abstract:

The Broussard Wastewater Treatment Plant pumps approximately a million gallons of nutrient rich effluent a day using four outflow pipes onto two cypress swamp sites, while another reference cypress swamp is left dry. The pumping of such effluent onto these assimilation wetlands is done as a method of denitrification and carbon sequestration. A major concern in these wetlands is the loss of large woody vegetation and the overgrowth of shrubbery and other fast-growing wetland plants. The amount of dead wood on the ground is a useful metric for how much carbon is being stored in the wetland and how much woody vegetation died. To quantify how much dead wood was in each site a survey was conducted using four non-intersecting transects radiating from two randomly plotted points. At each transect, data about small, medium, and large wood was collected at varying distances from the plotted point, and each piece of wood was categorized as sound, intermediate, or rotten. Four spherical densiometer readings were taken in cardinal directions at each plot point and used to determine canopy density. We hypothesize that the sites covered in effluent will have a larger amount of dead wood than the reference site, and that the canopy cover at each of the experimental sites will be much less than that of the reference.

Decreasing Compassion Fatigue Among Pediatric Intensive Care Nurses Using Self-Care Skills and Compassion Fatigue Training

Presenter: Julie Wilcox

Area of Study: Nursing

Advisor/Secondary Author: Sonya Briggs

School: University of Louisiana at Lafayette

Abstract:

Pediatric intensive care unit nurses are routinely exposed to severe injuries and traumatic events. The continuous exposure to these events often leads many to experience compassion fatigue. Work environments that embody compassion fatigue lead to less quality care and workplace dissatisfaction. Educating pediatric intensive care unit nurses through interventions could be a preventative method to reduce the amount of nurses that experience compassion fatigue. These educational interventions could lead to better care and other positive outcomes by improving communication skills and lessened employee burnout.

Determinants of Games Missed Following Concussions in the NFL

Presenter: Abigail Lewis

Area of Study: Kinesiology

Advisor/Secondary Author: Jeremy J. Foreman

School: University of Louisiana at Lafayette

Abstract:

Concussions in the National Football League (NFL) have become a rising topic for decades because of the active research that has been conducted regarding them. The NFL has protocols in place to alleviate the severity of concussions on their players. Among these protocols is rest time following concussions, which varies among players. The purpose of this study is to analyze determinants of games missed following concussions sustained in the NFL. Regression analysis is used to examine NFL data from 2012 through 2015. More valuable players, such as quarterbacks, have more time off following concussions than other players. However, more used players are rushed back into games quicker. Other factors such as previous concussions sustained and how recent the concussion occurred in the sample period also determine how much time off players receive following concussions.

Development and Testing of a Microbial Fuel Cell Prototype

Presenter: Kyle Zappi

Area of Study: Chemical Engineering

Advisor/Secondary Author: William Holmes, Kyle Leleux

School: University of Louisiana at Lafayette

Abstract:

A Microbial Fuel Cell (MFC) prototype was developed using materials that are commonly found in hardware store. This was done with an overall goal of utilizing the prototype to evaluate waste streams (particularly those around Lafayette, LA area) for their potential to produce power. Once the MFC was completed, the prototype was tested using glucose as substrate with anaerobic digester sludge as seed microorganism.

Difficulty in Emotion Regulation as a Mediator of the Relation between Adverse Childhood Experiences and Attachment Insecurity

Presenter: Ashley Hughes, Lindsey Held, Krista Malley

Area of Study: Psychology

Advisor/Secondary Author: Dr. Hung-Chu Lin

School: University of Louisiana at Lafayette

Abstract:

Research has indicated that adverse childhood experiences (ACEs) are associated with negative outcomes in emotion regulation and attachment insecurity. As well, attachment insecurity is associated with impairment in the regulatory process of emotions. This study examined how ACEs and attachment insecurity related to each and how difficulty in emotion regulation played a role in this relation. A sample of 482 college students responded to self-report measures, including the Adverse Childhood Experiences, the Difficulties in Emotion Regulation Scale, and the Relationship Scales Questionnaire for the assessment of adverse childhood experiences, difficulty in emotion regulation, and attachment insecurity (including attachment anxiety and avoidance) respectively. Separate regression analyses were conducted to examine the mediating role of difficulty in emotion regulation in the associations of ACEs with attachment anxiety and with avoidance, respectively. The results indicated that ACEs scores positively predicted both attachment anxiety and attachment avoidance, and that difficulty in emotion regulation mediated both the associations of ACEs with attachment anxiety and with attachment avoidance. However, difficulty in emotion regulation appeared to play a more important role in accounting for the relation between ACEs and attachment anxiety than in the relation between ACEs and attachment avoidance. The findings suggest that difficulty emotion regulation caused by adverse childhood experiences is more relevant to negative views of the self (typical of attachment anxiety) than to negative views of others (typical of attachment avoidance). Gaining a better understanding of the role of difficulties in emotion regulation in the relation between ACEs and attachment insecurity would allow for possible improvements or early interventions to aid in healthy attachment style development. Implications for targeting emotion regulation as a means of ameliorating harmful effects of ACEs on attachment functioning will be discussed.

Difficulty in Emotion Regulation as a Moderator of the Relation between Adverse Childhood Experiences and Depressive Symptoms

Presenter: Lauren LaHaye, Maddison Knott, Steven Stringfellow

Area of Study: Psychology

Advisor/Secondary Author: Dr. Hung-Chu Lin, Sarah Flynn

School: University of Louisiana at Lafayette

Abstract:

Prior research has documented the relation between adverse childhood experiences (ACEs) and negative outcomes in affective functioning. However, information is limited on the factors that may potentially affect the relation between ACEs and affective disorders. The purpose of this study was to examine the relation between adverse childhood experiences and depressive symptoms and how difficulty in emotion regulation moderated this relation. A sample of 482 college students responded to self-report measures, including the Adverse Childhood Experiences, the Depression and Anxiety subscales of the Depression Anxiety and Stress Scale, and the Difficulties in Emotion Regulation Scale for the assessment of adverse childhood experiences, depressive symptoms, and difficulty in emotion regulation, respectively. The results indicated that ACEs score positively predicted depressive symptoms, and that difficulty in emotion regulation exacerbated the relation between ACEs and depressive symptoms. The findings underscored a moderating role of difficulty in emotion regulation such that as difficulty in emotion regulation increased, the association between ACEs and depressive symptoms intensified. However, for those individuals who reported low levels of difficulty in emotion regulation (individuals with high competence in emotion regulation), their ACEs scores did not significantly predict depressive symptoms. The findings have implications for targeting emotion regulation competence in individuals exposed to childhood adversity for ameliorating the vulnerability to depressive symptoms.

Domestic Violence: A Child's Mental Health

Presenter: Sheriel Fludd

Area of Study: Sociology

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

According to Hungerford, (2010) future research should examine the severity of witnessing intimate partner violence as a minor and its impact on mental adjustment as an adult. The purpose of the presentation is to examine the perceptions of the severity of witnessing Intimate Partner Violence as a minor and its impact on mental adjustment as an adult. The research question that will be addressed is: What are the perceptions of the severity of witnessing intimate partner violence as a minor and its impact on mental adjustment as an adult? Results will be shared from interviews and focus groups

Effects of Stereoscopic 3D on Video Game Performance

Presenter: Matthew S. Boudreaux, Seth Miley

Area of Study: Computer Science

Advisor/Secondary Author: Dr. Arun K. Kulshresth

School: University of Louisiana at Lafayette

Abstract:

It has been shown that playing games in 3D stereo does not provide any significant performance benefits than with using 2D display. However, most previous studies used games that were not designed with stereoscopic 3D viewing in mind. In addition, the past studies used self-reported data (excitement level, sense of engagement, etc.) to measure user experience. We studied several games that were optimized for stereoscopic 3D viewing and used EEG and heart rate sensors to better gauge the user's experience with these games. Using a stereoscopic 3D display and a pair of shutter glasses, we examined five games, each representing a specific game genre and each having been designed for stereoscopic viewing. We measure quantitative and qualitative data for each game to determine if the experimental group (using stereoscopic 3D display) had a better gaming experience compared to the control group (using monoscopic display). Our preliminary results indicate that Stereoscopic 3D does provide benefits in tasks where depth information is useful for the game task at hand.

Electrospun Polypropylene Carbonate and Polyacrylonitrile based Solid Polymer Electrolytes for Lithium Ion batteries

Presenter: Nicholas Campo

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. Ling Fei, Jed LaCoste

School: University of Louisiana at Lafayette

Abstract:

Lithium ion batteries are amongst the most used power sources used by today's society because of their high energy density; however, current technology for lithium ion batteries has a high potential to not be safe for large scale applications and general use. Traditional lithium ion batteries utilize an organic liquid electrolyte to transport lithium ions between electrodes. Organic liquids used in lithium ion batteries, such as diethyl carbonate, are highly flammable and volatile. Safety becomes an issue when the battery heats from charging, discharging, or if the battery shorts circuits due to dendrite formation in the cell. When this happens, the battery can expand and burst into flames. Our group's focus is developing novel solid polymer electrolytes for lithium ion batteries. Polypropylene Carbonate (PPC) and Polyacrylonitrile (PAN) are good candidates for solid polymer electrolytes because of their relatively high ionic conductivity, as well as low flammability. Electrospinning is a versatile technique that can be used to produce nanofibers from polymer solutions. In our study, electrospun nanofibers of PPC will be used as the solid polymer electrolyte support. During the electrospinning procedure, the porosity, diameter, and alignment of the nanofibers can be modified to increase lithium ion transport within the cell. PAN and Lithium Bis(trifluoromethanesulfonyl)imide (LiTFSI) will then be deposited onto the electrospun nanofibers using a facile casting method. This process will be repeated for PAN nanofibers with PPC and LiTFSI as the Solid Polymer Electrolyte. Upon

evaporative drying of the solid polymer electrolyte, several tests are to be performed to characterize the electrolyte material as well as battery performance. These tests include cyclic voltammetry, Fourier Transform Infrared Spectroscopy, A.C. Impedance Spectroscopy, and Scanning Electron Microscopy. Through this procedure, our lab group expects to develop a high-performance electrolytic material for lithium ion batteries.

Estimating Pulmonary Return Characteristics in Virtual Patient Models

Presenter: Seth Harson

Area of Study: Mechanical Engineering

Advisor/Secondary Author: Charles Taylor, Jacob King

School: University of Louisiana at Lafayette

Abstract:

Heart disease and heart failures are the leading causes of death in the U.S., and heart assist devices are one of the main solutions to supporting people that suffer with heart disease. Assist devices support the heart by pumping blood directly to the aorta to keep a consistent flow of blood. By determining the behavior of the patient's heart and blood vessels, the assist device can be adjusted and fine-tuned prior to entering the patient's body. A patient's circulatory system can be simulated and studied with the aid of a mock circulatory system. The mock circulatory system is a hydraulic circuit that models the aspects of a human circulatory system. Using this in vitro means of research, it avoids the use of intensive and invasive tests done on the body to obtain patient specific data. Based on previous research, a pulmonary simulator that can simulate the pressure and flow rate into the heart can be used to study the hemodynamics of a patient's heart. The purpose of this simulator is to be adaptive to any patient to report accurate data to aid in the making of assist devices. This pulmonary simulator was modeled in MatLab's SimuLink and simulates the pulmonary system with the use of a Windkessel model and PI-controlled hydraulic system. The current state of this pulmonary simulator reports data for a standard adult heart, a geriatric patient, and a geriatric patient with heart failure. While this data proves useful, it is not patient specific without inputted values directly into the RCL circuit of the Windkessel model. In MatLab's SimuLink, parameter estimation is a tool designed to narrow the value of variables in a system when given the input and output values. Parameter estimation is essential to creating patient specific simulations to effectively study the behavior of a patient's circulatory system, which can then provide the necessary information for personalized assist devices.

Experiential Learning Approach to the Development of a Web App

Presenter: Eraj Khatiwada

Area of Study: Business & Computer Science

Advisor/Secondary Author: Dr. Minh Huynh

School: Southeastern Louisiana University

Abstract:

This poster shares our experience in developing a Web App to support the Business Week event at Southeastern Louisiana University. This project was based on a real-world need. The work was guided with the eight principles in an experiential learning activity to ensure the

delivery of the App as well as the learning and the experience elements. The paper described the tools used in the development and the process of learning and doing the work. It illustrated how BizWeek Web App works and ended with the reflection and evaluation of the experience.

Facile Synthesis of Porous ZnCo₂O₄ Nanofibers for Prospective Supercapacitor Electrodes

Presenter: Ryan Cook

Area of Study: Chemical Engineering

Advisor/Secondary Author: Ling Fei, Hui Guo

School: University of Louisiana at Lafayette

Abstract:

A facile and effective synthesis of porous ZnCo₂O₄ nanofibers has been proposed by a two-step process involving electrospinning and subsequent thermal annealing treatment. The ZnCoO_x precursor was firstly prepared by electrospinning the polymer solution with Zn(NO₃)₂·6H₂O and CoC₂O₄·2H₂O dissolved. Then the obtained precursor was annealed at air/N₂ atmosphere to form porous structure, which will provide transport channel for electrolyte during charging-discharging process. The components and structure of the obtained ZnCo₂O₄ nanofibers will be determined by XRD (X-Ray Diffraction), SEM (scanning electron microscopy), TEM (Transmission electron microscopy), and XPS (X-ray photoelectron spectroscopy). More importantly, the electrochemical properties of the porous ZnCo₂O₄ nanofibers will be investigated by cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS) using three electrode methods in 2M KOH solution. The galvanostatic charge–discharge (GCD) was also carried out to evaluate the cyclic stability of the obtained materials. In addition, the effects of different annealing temperature on the porous structure and electrochemical performance will be investigated. The results indicated that the porous ZnCo₂O₄ nanofibers have potential as supercapacitor electrodes with high capacitance and excellent cycling performance.

Former Gang Members: Adjustment to Current Living Status

Presenter: Jha'Ceri Elmore

Area of Study: Criminal Justice

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

According to Coid (2013), future research is needed on effective intervention for gang members. The purpose for this presentation is to identify how former gang members have adjusted to their current living status. The research question addressed for this study is "How are former gang members adjusted to current living status?" Results will be shared from interviews with a psychologist and former gang members.

Glues Made from Biosolids Produced Through the Digestion of Sewage Sludge and Chicken Excreta for Use in Composite Materials

Presenter: Zoe Perez

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. William Chirdon

School: University of Louisiana at Lafayette

Abstract:

“Biosolids” are the product of treated sewage that result from the addition of bacteria to the primary sewage which then undergoes anaerobic digestion by these microorganisms. After digestion, the material is pressed to remove excess liquids. The resulting biosolids are an abundant byproduct of the sewage treatment process with very few uses. The goal of this work is to adapt a proven method of making glue from proteinaceous algae biomass to the biosolids. In both cases, water and a base or acid are added to the biomass. This changes the pH, which denatures the proteins. There were two major obstacles to consider when adapting the algal method to the biosolids. First, in the algae biomass, the cells have been lysed and lipids have been removed during the processing of the algae cake, while the biosolid contains the intact microbial cell structures. Therefore, different methods were tested to lyse the cells, which exposes the proteins within them to the denaturant. Heating and freezing the biosolids were tested to lyse the cells. Freezing treatments were tried with and without the addition of water. The second obstacle was that the biosolids contain more than the algal biomass, so the amount of water and other reagents added had to be adjusted. After these adjustments, the process for making glue from algae proved to work for the biosolids. Experiments were performed by mixing the biosolids with a denaturing solution which was sampled every half-hour for three hours, but the reaction time did not influence the strength of the glue. The base did prove to be a better denaturant than the acid. The biosolid results were then used as guidelines to develop a glue from chicken waste. Similar methods were tested to see if the chicken waste produced a glue comparable to that of the biosolid. Because the time did not seem to influence the strength of the glue, sample for this trial were tested every half hour for two hours. The resultant glues could be used as a binder that may be combined with natural fibers and pressed to make a composite material similar to particleboard. Because the glue is made of sustainably-sourced components, the composite would be more biodegradable than commercial particleboard and would be formaldehyde-free.

Graphene Nanoscrolls Induced Unique Crystallization of Poly (lactic acid)

Presenter: Caroline Werther

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. Dilip Depan, Oluwakemi Ajala

School: University of Louisiana at Lafayette

Abstract:

Due to their unique open topology, graphene nanoscrolls (GNS), which are carbon-based, one-dimensional nanomaterials, have been predicted to have extraordinary characteristics, but have not been studied for their effect on the polymer matrix when used as a nanofiller. Poly (lactic acid) (PLA), an environmentally friendly, biodegradable polymer with a promising outlook in the biomedical field, faces a major drawback in its use due to its brittleness and poor toughness. This creates a need for a nucleating agent within its polymer matrix. This study investigates the effects of graphene nanoscrolls on the morphology and crystallization behavior of PLA. GNS was obtained through thermal annealing and lyophilization of graphene nanoplatelets (GNPs), before being used in crystallizing PLA through solution mixing. FTIR and SEM show that

incorporation of GNS as a nucleating agent affects the crystallization of PLA. This is the first study found to look into the effect of GNS as a nanofiller.

How Deployments Impact the Marital Quality of Service-Men and their Partners.

Presenter: Briana Clay

Area of Study: Child and Family Studies

Advisor/Secondary Author: Dr. Sun-A Lee

School: University of Louisiana at Lafayette

Abstract:

Deployments can have a lasting impact upon service men and their entire families; causing a strain between both their partner and parental relationships. Service men are forced to place a hiatus upon their civilian lives in order to serve their federal duties (Newby, McCarroll, Ursano, Fan, Shigemura, & Tucker- Harris, 2005). The means of communication and frequency during this time can have a lasting impacting upon both partners (Rea, Behnke, Huff, & Allen, 2015). The deployment can impact marital quality, cause mental disorders and impact their interpersonal and intrapersonal relationships if not positively maintained. (Newby et al., 2005). Mental disorders, stressors, financial changes, family conflict, failing to accommodate to new roles are difficulties that many military families face (Erbes, Kramer, Arbisi, & DeGarmo, 2017).The research conducted has shown that communication is very important at this time in which frequent communication between partners has been shown to make the deployment process easier (Wilson et al., 2017).This allows for military members to feel connected to their stay at home partner because a lack of communication has been show to negatively impact the relationship quality causing anxiety for both parties (Carter et al., 2018). The use of social media, letters, video chats, and text messaging are forms of communication that provide instant gratification, which have been found to reduce, stress, and symptoms of mental disorders (Zamir, Gewirtz,&Zhang, 2017). Deployments are challenging but not all experiences are negative during this time, this challenge can strengthen the marital satisfaction and overall quality of life.

In Vitro Modeling of Adipose Tissue with Adipose-derived Stem Cells and Methacrylated Gelatin Scaffolds

Presenter: James Inderkummen

Area of Study: Biology

Advisor/Secondary Author: Amber Hale, O'Donnell BT, Ives CJ, and Bunnell BA

School: McNeese State University

Abstract:

Osteoarthritis (OA) is a common joint disease characterized by the degradation of cartilage and the growth of bone spurs. OA has usually been modeled by only the osteochondral interface being replicated. The finding of pro- and anti-inflammatory cytokines released by the infrapatellar fat pad (IPFP) suggests that the IPFP could play a role in OA. Even though there is an understanding that female, obese, and diabetic patients are more at risk for OA the exact cellular and molecular mechanisms for this link and the IPFP still need to be researched. A

methacrylated gelatin (mGL) scaffold seeded with adipose-derived mesenchymal stem cells (ASCs) could potentially model the IPFP in OA joint models. The ASCs were placed in mGL to prove that ASCs could be efficiently differentiated into adipose tissue. The viability of ASCs were assessed by a Live/Dead Assay. The adipogenesis of the mGL tissue was confirmed utilizing Oil-Red-O for neutral lipid vacuole formation and RT-qPCR for common adipogenic markers adiponectin (APN), uncoupling protein one (UCP1), peroxisome proliferator-activated receptor gamma (PPAR γ), and CCAAT/enhancer binding protein beta (C/EBP β). ASCs were alive and proliferated throughout the 28 Days. Oil-Red-O staining confirmed larger lipid vacuoles within the differentiated cell lines. RT-qPCR results displayed a higher gene fold change in the expressed adipogenic markers of APN and PPAR γ in the differentiated cell lines at 14 and 28 days. ASCs were successfully differentiated in the mGL.

Incarceration and its Effects on Juveniles: Pushing for Alternative Sentencing

Presenter: Yasmeen Williamson

Area of Study: Criminal Justice

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

According to Dmitrieva, Monahan, Cauffman, and Steinberg (2012), future study is needed to test whether such efforts cannot only protect youths from the short-term negative effects of incarceration but also have an additional benefit of reducing juvenile offending(1089). The purpose of this presentation is to examine alternative juvenile sentencing and its impact on reduced juvenile offenders. The research question to be addressed is "What alternatives can the juvenile justice system implement to reduce recidivism rates"? Results from interviews and focus groups will released rehabilitation patients will be discussed.

Individuals' Perceptions of a Hypothetical Sexual Assault and Engagement in Prosocial Behavior

Presenter: Dylan A John

Area of Study: Psychology

Advisor/Secondary Author: Amy L. Brown, Haven J. Evans, Raven N. Douglas

School: University of Louisiana at Lafayette

Abstract:

The current study examines how alcohol priming affects participant responses to a sexual assault scenario and the likelihood of participating in prosocial behaviors in the future. Participants (n=314) from a general population sample were randomly placed into either a food or alcohol priming condition. After answering several questions regarding the stimulus they were exposed to, participants were instructed to read a party scenario in which the reader walks in on a sexual assault. Participants were then asked to complete the Party Scenario Questionnaire (PSQ) which assessed the participants' perception of the scenario. Afterwards, participants completed the Bystander Intention to Help Scale (BIHS; Banyard, 2008). Factor analysis revealed four factors in the party scenario questionnaire: Unwillingness to Intervene,

Concern/Responsibility, Lack of Confidence, and Others Responsibility. The means of the responses for these factors were compared to the BIHS means. Correlational analysis revealed significant relationships between the BIHS and three of the four factors on the party scenario questionnaire (Unwillingness to Intervene, Concern/ Responsibility, and Lack of Confidence). In addition to the PSQ and BIHS, participants were asked how frequently they consume alcohol and how frequently they attended parties/bars. Analyses were completed to determine if individuals who consumed more alcohol or attended parties/bars more frequently differed significantly from those who attended/drank less frequently. Results indicated that there were significant associations between frequency of alcohol consumption and the lack of confidence factor from the PSQ. There were also significant associations between frequency of party/bar attendance and BIHS means, the concern/responsibility factor from the PSQ, and the lack of confidence factor for the PSQ. There were no significant differences in individuals who were exposed to the food priming condition compared to those exposed to the alcohol priming condition.

Investigation of Natural Products for Hypertension Treatment

Presenter: Lauren Prudhomme

Area of Study: Chemical Engineering

Advisor/Secondary Author: William Holmes, Samantha McKisson

School: University of Louisiana at Lafayette

Abstract:

With an ever-increasing dependence on costly pharmaceuticals with far too many serious side-effects, the modern world has been making a conscious shift towards holistic, natural remedies. One important avenue for the nature-based medicine market is the treatment of high blood pressure. Mainstream pharmaceutical treatments for hypertension are directly linked to heart palpitations, constipation, and anemia. In this study, black cherries were considered as a possible alternative to these potentially-harmful drugs. The cherry juice was separated into two layers via, treatment with MeOH and DME, and vacuum filtering. The lower, gummy layer, F1, was acquired, and the upper, homogenous layer was centrifuged into two fractions. The slightly gummy fraction containing mostly polar compounds, F2, was further separated into three sub-fractions using Sephadex LH-20 column chromatography. Remaining was the fraction containing mostly non-polar compounds, F3. This fraction was also separated into three sub-fractions by silica gel column chromatography. Each of the six sub-fractions along with F1 were administered to a group of five primates to observe the effects observed on blood pressure. One of the fractions, F2SF3, was found to cause a very large drop in blood pressure in all primates. To investigate the active ingredient in this "hot" fraction, all of the fractions were dissolved in a 50/50 solvent mixture of acetonitrile and reverse-osmosis de-ionized water. Through tandem mass spectrometry, the concentrations of different compounds in each of the fractions were compared. The hot fraction showed the highest concentration of product ion m/z 249 and the lowest concentration of m/z 221. Further studies are needed to determine the identity of these ions and their effect on human hypertension.

It Couldn't Possibly Happen Here: Social Perceptions of Sex Trafficking in College Students

Presenter: Bryce Carter

Area of Study: Sociology

Advisor/Secondary Author: Dr. JoAnne DeRouen

School: University of Louisiana at Lafayette

Abstract:

Sex trafficking rates are sharply rising in the United States, specifically in Louisiana. Known as the NIMBY (Not in My Backyard) phenomenon, Louisiana college students acknowledge sex trafficking as a contemporary social issue yet fail to recognize its proximity or its closeness to their lives. Understanding that college students are the accumulation of knowledge from parents, friends, education, and experiences, I propose that first-year students manifest the NIMBY paradigm greater and are less knowledgeable about sex trafficking than seniors. I analyzed 151 returned questionnaires given to current undergraduate students attending the University of Louisiana at Lafayette in the fall 2018 semester. Students answered questions using a modified version of the Bogardus social distance scale and self-reported what they knew about sex trafficking and the mediums in which they learned said information. The data reveals a consistent trend in acknowledging sex trafficking's existence in the larger regions of the United States and Louisiana, but trends downward and variates in beliefs of sex trafficking occurring in Lafayette Parish, neighborhoods, and so on. Though most do not believe sex trafficking exists in their communities, a significant number of participants note that trafficking happens "closer than we think, even if we cannot see it firsthand." For mediums of learning and knowledge, seniors take the lead on both, as shown in the expressively detailed answers about sex trafficking. Freshmen's responses were similar and repetitive, suggesting that advocacy programs have made their way around. The hypothesis is generally supported and demonstrates the presence of the NIMBY paradigm, albeit not as large of a disparity as once theorized.

Jessica Hardy vs. USADA (2008)

Presenter: Jaquinta Graves

Area of Study: Kinesiology

Advisor/Secondary Author: Dr. Peter Omondi-Ochieng

School: University of Louisiana at Lafayette

Abstract:

The debate on performance enhancement drugs (PEDs) in sports is a recurring topic due to the severity of the effects. Anti-doping organizations such as the U.S. Anti-Doping Agency exists to highlight the effects of PEDs in athletes. Due to the potential to drastically alter the human body and biological functions is why the USADA's mission is to preserve the integrity of competition.

Banned substances include but are not limited to:

Anabolic Agents – treat delayed puberty

Diuretics – treat hypertension, kidney disease

Stimulants – treat attention deficit disorders (ADD/ADHD)

Narcotics - relieving severe pain & inducing sleep

Glucocorticosteroids – treat allergies & asthma
Beta Blockers – treat hypertension, cardiac arrhythmias
Blood Doping –to increase the red blood cell mass

Overview: Anti-doping programs rely on testing, Six out of ten athletes use PEDs. The ability to detect drug misuse is limited because many athletes know the pharmacokinetics and pharmacology of the drugs they take. The research provided will highlight Olympic athlete, Jessica Hardy in violation to the WADA code.

LGBTQ Reproductive Health Care

Presenter: Sirraaj Salem

Area of Study: Gender and Sexuality Studies

Advisor/Secondary Author: Mrs. Marian Jackson-Scott

School: University of Louisiana at Lafayette

Abstract:

This paper researches reproductive health care of individuals that identify as LGBTQ (Lesbian, gay, bisexual, transgender, and queer) who are assigned female(s) at birth (AFAB). Individuals who are AFAB are defined as people who were born with a vagina but may not consider themselves as a female or align with its gender roles. Reproductive health care incorporates the female anatomy and related health, as well as preventive health care. LGBTQ AFAB people face discrimination in reproductive health care. Housel and Harvey discuss the types of discrimination that reproductive health care providers pose on these individuals (2014). Doctors may hinder same-sex couples from having their own children and refuse to refer a patient to a competent doctor to help with gender transition. Transgender men have extended barriers in obtaining reproductive health care compared to other LGBTQ AFAB people. This is due to the stigma of looking like a male while they still have female sex organs (Wingo, Ingraham, & Roberts, 2018). Their study also mentioned that doctors ignored related reproductive health issues that participants asked to be treated for. Most research concluded that LGBTQ AFAB individuals received poor reproductive health care and avoided seeking it because of past negative experiences. The decrease in routine preventive health care may be unhealthy because STD's and other health issues can go untreated. Providers lack in medical training of LGBTQ health concerns (Stott, 2013). Reproductive health care providers should be familiar with their patients' sexual orientation and gender identity in order to provide them with individualized reproductive health care. Further research of LGBTQ AFAB individuals is necessary in order to shed light on their right to access proper reproductive health care. Research needs to document long-term health effects of neglecting reproductive health care to promote awareness and increase its qualities among LGBTQ AFAB people.

Lights, Camera, Fracture : A New Way to Characterize Hydraulic Fracturing

Presenter: Archie Gerard Metoyer, Jr., Anh T Le

Area of Study: Petroleum Engineering

Advisor/Secondary Author: Dr. Mehdi Mokhtari

School: University of Louisiana at Lafayette

Abstract:

Digital image correlation (DIC) is a unique technique to measure strain development on a surface of interest. This method is widely used in many industries. With Material Test System along with Vic 2D software, we were able to apply DIC for the process of measuring strain on the surface of the rock and studying the fracture propagation in Shale. This solution can be applied in different industry areas to replace the normal method, and it gives more efficient values.

Making Glue from Algal Biomass Using Non-toxic Denaturants

Presenter: Molly Key

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. William Chirdon

School: University of Louisiana at Lafayette

Abstract:

Algal biomass, or algae cake, is a waste product that is made in abundance during the making of biofuel from algae. This waste is the reason that algal biofuel is not currently possible, so research is being done to find a use for this biomass. A glue can be made using this algae cake, water, and a denaturant. This glue, along with other waste materials has been used to make particle board, coasters, and paper. It has also been used to make biodegradable Mardi Gras beads, a children's glue, and paper mâché. During these experiments, sodium hydroxide has been used as a denaturant in the glue. The only problem is that sodium hydroxide is toxic. To solve this, a different denaturant must be found. A suitable denaturant for this purpose must be safe, non-toxic, eco-friendly, and sustainable. To start with, lemon juice, Coca-Cola, 1 M acetic acid, and 1.5 M acetic acid were chosen. The different denaturants were tested at different volumes and compared to the same volume of sodium hydroxide. These denaturants were tested to find their shear strength, which is the standard that most glues are normally held to. If a suitable way to market this glue could be found, everyone could be driving cars running on algae fuel. This research is a step towards this.

Making Paper Products Using Algal Biomass and Post-Consumer Paper

Presenter: Kennedy Guillot

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. William Chirdon

School: University of Louisiana at Lafayette

Abstract:

In recent years, there have been major advances in the large-scale production of biofuels based on algal lipid extraction, which could potentially provide an environmentally-friendly fuel source. However, due to the high cost of this lipid extraction, there exists a problem in creating a biorefinery that is profitable when the only valuable products are the biofuels. The extraction process produces a large amount of protein byproducts that would make it economically impractical to produce the biofuel if these byproducts need to be disposed of as wastes. By increasing the profitability of this byproduct, referred to as post-extracted algal residue (PEAR), operation of these biorefineries can become profitable, and biofuels may be considered economically feasible. One potential way of utilizing the PEAR is to craft it into glue. The formulation of the glue is a simple process, done by denaturing the proteins which creates an adhesive. Further research into the application of this adhesive has demonstrated its practicality in papermaking. By blending the glue with recycled paper, a variety of paper products can be produced. The glue-paper mixture creates biodegradable paper that can be written or printed on. Thicker layers of this mixture formulate paper strong enough to be comparable to cardstock. Additional experimentation indicates that adding sugarcane bagasse into the glue-paper mixture generates composites similar in strength and coarseness to cardboard. Drying methods prove to be another significant factor in determining the strength of the glue-paper and have been another factor to consider in experimentation. Overall, the adhesive created by the algal biomass demonstrates great potential for use in paper products and makes algae-based biofuels more viable as profitable industry.

Marine Debris Cleaner, Phase 1: Navigation

Presenter: Ryan Fabre

Area of Study: Industrial Engineering & Technology

Advisor/Secondary Author: Dr. Ahmad Fayed

School: Southeastern Louisiana University

Abstract:

The purpose of this project is to provide a solution to the recently occurring environmental problem caused by debris in the world's bodies of water. The challenge is to design a vessel that can autonomously detect sea debris, navigate toward them, pick them up and return back to its launching location. The project has multiple parts that fall mainly into two mechanisms; a navigation mechanism and a retrieval mechanism. In the first phase of the project, the navigation part for the proposed marine debris cleaner is investigated. The navigation mechanism acts as the base for the whole project and has multiple functions and sub-mechanisms. The navigation mechanism includes an object detection module, that detects specific object within a given distance, a vessel speed control, which controls the vessel speed while approaching debris, and a steering mechanism which control the direction of the rudder

based on the original direction of the detected debris and the differential direction as the vessel approaches the detected debris. The navigation could also in the future include a homing module that will allow the vessel to come back to certain coordinates. The retrieval mechanism is an appended part of the project that will be investigated and completed in the next phase. A prototype has been created to simulate the navigation functions of the debris cleaner using an Arduino board, LIDAR sensor, 2 servo motors, 1 brushless DC motor and a Raspberry Pi camera.

Market Research for Composite Materials Made from Algae Glue and Sugar Cane Bagasse

Presenter: Julia Lavefalk

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. William Chirton

School: University of Louisiana at Lafayette

Abstract:

Over the past few years, our research group in the Chemical Engineering department at the University of Louisiana at Lafayette have been creating various composite materials using a glue made from algae protein (post-extracted algal residue – PEAR) and sugar cane bagasse. One of the goals is to find out if there is a viable market for selling these composite products. These composite products are all-natural, plant-based, and formaldehyde-free. They are also sustainably-sourced and very cost-effective. Coasters are a potential composite that can easily be produced and offer a unique look that would attract a wide range of consumers. Currently, we are continuing to develop a variety of prototypes while creating a business plan for the gradual commercial scale-up of a student-driven startup business.

Measuring Moral Panic: Is Fear Based News Shaping our Behavior?

Presenter: Hannah Pipes and Kaitlyn Thompson

Area of Study: Criminal Justice

Advisor/Secondary Author: Dr. Michelle Jeanis

School: University of Louisiana at Lafayette

Abstract:

The media has a tendency to shape the behavior of the general public. The content of media coverage is a key variable in resulting behaviors of media followers. Media coverage on serial killers, referred to as fear-based media, has the power to inspire moral panic and shape the behavior of viewers. The details presented, length of media coverage and the amount of exposure the public has to the coverage are influential factors of public behavior. This study is designed to measure how serial killers are talked about in the media and if the content of media coverage has changed over time. This study also measures the connection between fear based media and google trends of fear related terms. Preliminary results of the study suggest that not every serial killer receives the same amount of media coverage as a result of the characteristics of the killer and the case.

Micromachining Injector Nozzles Using a 5-axis CNC

Presenter: Noah Deshotels

Area of Study: Mechanical Engineering

Advisor/Secondary Author: Charles Taylor, John Thomas Frank

School: University of Louisiana at Lafayette

Abstract:

The combustion engine continues to be a predominant option for transportation and other services, despite the cost of the harmful CO₂ emissions that they produce as a by-product. The severity of the emissions produced depends on many factors, but the average droplet size of the fuel sprayed into combustion chamber has a significant impact on the efficiency of the combustion. The goal of reducing emissions is possible by reducing the average droplet size of the spray, which can be achieved through flow-blurring injection. Flow-blurring is a type of spray pattern achieved when using the correct injector nozzle height in relation to the exit orifice part of the injector nozzle. This spray pattern ensures smaller average droplet diameters when combining a liquid stream and a gas stream within the injector, which is how the aerosol spray is formed. Backflow occurs within the injector tube between the liquid and gas phases, which ensures that the two will mix to become a finer mist and reduce emissions. Our goal is to manufacture different injector heads with different grooves using a PocketNC machine along with Fusion360 CAD software. The software's CAM feature pairs perfectly with the 5-axis machining tool, which allows us to make complex and precise cuts into materials like acrylic, brass, and aluminum. Taking these injectors, we can conduct spray tests to simulate how they would produce emissions and modify the height as a variable as well. Due to the complexity of the flow-mechanics, experimentalism has shown to be the only option for this pursuing this research.

Micro-Pixe Analysis of a Chondrite

Presenter: Kaitlin Boudreaux and Sarah McCleskey

Area of Study: Physics

Advisor/Secondary Author: Manavi Jadhav, Harry J. Whitlow, Henry Udeogu, and
Naresh Deoli

School: University of Louisiana at Lafayette

Abstract:

Particle-Induced X-ray Emission (PIXE) is a form of spectroscopy in which a beam of MeV-ions bombards an object to create an electron state change. Each element, even at the trace level, has a characteristic X-ray emission that can be detected and quantified. PIXE analysis can analyze a sample with minimal damage and is more sensitive than traditional energy dispersive X-ray analysis.

The present study uses quantitative Micro-PIXE elemental analysis at the Louisiana Accelerator Center, to classify and sub-classify an unknown chondritic meteorite into one of the four chondrite classes (enstatite, carbonaceous, ordinary, R, and, K-chondrites). Most chondrites remain largely unaltered since their formation in the early Solar System and this provides insight into the chemistry of its formation stages. We present some preliminary data and results from this study.

Modeling and Control of a Robotic Arm Using SimMechanics

Presenter: Daniel Sweeney

Area of Study: Mechanical Engineering

Advisor/Secondary Author: Charles Taylor, Jacob King

School: University of Louisiana at Lafayette

Abstract:

A verification and validation (V&V) process assists with problem solving and vetting complex system function to expedite the development and deployment. This project was to understand the roles that Solidworks and MathWorks tools can serve in an electromechanical system that employs closed loop controls. Solidworks was used to spatially model the physical components, in this case a SCOR-Bot manipulator that is used for educational purposes. Finite Element Analysis and motion analysis were conducted within Solidworks to check the accuracy of the model's representation to a real-world system, and checked with manual calculations. Once the model was optimized in Solidworks, it was transformed into a Simscape Multibody model represented through a block diagram in the Simulink model-based design software. Within Simulink environmental parameters can be added to the model and signals can be recorded at critical points to verify functional outcomes while performing tasks in a work simulation. Comparing recorded input-output signals, a computational plant model can be developed for controller tuning. Simulink offers a wide array of Control Design toolbox capabilities for these complex systems. Utilizing Simulink Realtime, a hardware-in-the-loop (HIL) simulation can be pursued to validate the deterministic execution of the control code on the target processor. Once the code is validated, it can be deployed to the controller and connected to the SCOR-bot. The validation of the processor-system is made by comparing the performance of the physical system to the modeled action.

Mold Optimization of a Left Ventricular Outflow Tract to Ascending Aorta In Vitro Phantom

Presenter: Andrew Hoffpauir

Area of Study: Mechanical & Biomedical Engineering

Advisor/Secondary Author: Charles Taylor, Clint Bergeron

School: University of Louisiana at Lafayette

Abstract:

Many people suffer from cardiovascular diseases, and improving care for people suffering from these conditions is important. The left ventricle outflow tract-to-ascending aorta is one heart valve, that houses many cardiovascular diseases. Creating silicone models to investigate valve functions is necessary to improve care for these patients. In vitro testing can be done with silicone models to investigate valve functions. Developing 3-D printed molds from an accurate CAD model of the left ventricle outflow tract-to-ascending aorta in SolidWorks is necessary in developing high-quality silicone models for in vitro testing. Creating the mold in SolidWorks requires the use of the Surfaces toolbar due to the complex geometry of the model. This allows the mold set to have two dissolvable inserts. The mold of the left ventricle outflow tract-to-ascending aorta is simplified from a sixteen fixed-piece mold set to a four fixed-piece mold set with two dissolvable inserts. The inserts allow for the silicone to cure around the insert. The

insert is dissolved in water to result in a single cast piece of the model. This reduces the number of silicone pieces that are glued together from eight to two. The need for high-quality silicone models requires this mold set to be sent out for Stereolithography (SLA) high resolution printing. Simplifying the model into two silicone pieces allows the valve to be isolated for in vitro testing that can determine the function of the left ventricle outflow tract-to-ascending aorta while keeping other factors fixed. Creating a standard mold development for the left ventricle outflow tract-to-ascending aorta is important for investigating the functions of the valve.

Monitoring Concentrations of Fecal Indicator Bacteria in Water Bodies Impacted by Aerobic Sewer System Effluent

Presenter: Hannah Canter, Canon Cart, and Kyle Delino

Area of Study: Microbiology

Advisor/Secondary Author: Chris Struchtemeyer

School: McNeese State University

Abstract:

Aerobic sewer systems are used to treat wastewater in many rural areas of the United States. Many of these systems discharge effluent directly into ditches and ravines that rely on sunlight for disinfection purposes. This practice is problematic since very few studies have examined whether effluent from aerobic sewer systems is adequately disinfected by sunlight. In many cases, the disposal ditches or ravines that receive effluent from aerobic sewer systems flow directly into or near major recreational water bodies. The goal of this work was to assess the environmental impacts of aerobic sewer system effluent by monitoring the microbial quality of water from: 1) Ditches and ravines where aerobic sewer system effluent gets discharged and 2) The Calcasieu River, which intersects with several ditches and ravines that collect aerobic sewer system effluent. The microbial quality of ditch, ravine, and river samples was evaluated by monitoring concentrations of fecal coliforms and *E. coli*. The results of this work showed that concentrations of fecal coliform bacteria and *E. coli* ranged from 1.3×10^3 to greater than 1.5×10^5 cfu/100 ml and undetectable to 8.4×10^4 cfu/100 ml, respectively in ditches and ravines where aerobic sewer system effluent was disposed. Fecal coliform bacteria and *E. coli* were typically undetectable in the Calcasieu River during periods of dry weather, but ranged from 2.0×10^3 to 8.8×10^4 cfu/100 ml and 5.0×10^3 to 9.5×10^3 cfu/100 ml, respectively following rain events. These results show that fecal indicator bacteria from aerobic sewer systems persist in disposal ditches and ravines and are then flushed into the Calcasieu River during rain events. These observations represent a significant public health concern since the Calcasieu River is used for a variety of recreational activities including fishing, boating, jet skiing, and swimming.

Morphology Effects of Nanoparticle Structure on Nanohybrid Shish-Kebab Architecture of PE-b-PEG Interfacial Crystallization

Presenter: Padma Pellegrin

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. Dilip Depan, Nina Collazos, Arafat Noor, Tuan Lee

School: University of Louisiana at Lafayette

Abstract:

Crystallization of co-polymers on various nanoparticles has resulted in the development of novel nanohybrids with improved thermos-mechanical properties. The ultimate structure of the nanohybrid and its properties largely depends on the shape/size and geometry of the nucleating agent. Moreover, the chemical structure of the nucleating agents can affect the interactions with the polymer. Herein we report a simple, rapid, yet facile method to fabricate nanohybrids using various nanoparticles. Organic nanoparticles such as carbon nanotubes, graphene, and carbon nanofibers were used to crystallize a copolymer of poly (ethylene-b-polyethylene glycol). Clay, organo-modified clay, and tubular halloysite was also used to induce heterogeneous crystallization of this copolymer. Carbon nanotubes (CNTs) and carbon nanofibers (CNFs) primarily give a unique nanohybrid shish-kebab (NHSK) architecture, due to their tubular structure and favorable chemical structure. On the other hand, inorganic clay-based nanoparticles generated a globular stacked and intercalated structure. The final morphology of crystallized polymer was found to result from the competition between geometrical confinement and favorable chemical structure of the nucleating agent. This work shows a promising approach towards generating polymer crystals of tunable properties.

Pain-Relieving Chitosan Hydrogel to Aid Soft Tissue Recovery

Presenter: Vanel Porter

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. Dilip Depan, Saad Bux

School: University of Louisiana at Lafayette

Abstract:

Traumatic injury is a life-threatening prospect for soldiers in combat as well as civilians in serious accidents, such as motor vehicle accidents. Uncontrolled hemorrhage i.e. excessive loss of blood due to injury is a leading cause of death in soldiers and civilians. Hemorrhage can be controlled by applying pressure on the wound, however, this approach might not be suitable for injuries that occur in soft-tissues or organs such as eyes, lungs, liver, kidney, spleen, and neural tissue damage. This research is involved in the formulation of a gel that can be applied on a soft tissue to prevent excessive blood loss while providing anti-inflammatory and antibacterial benefits. The gel was prepared using chitosan, which is considered as the second most abundant biopolymer on this planet. The gel was loaded with a non-steroidal anti-inflammatory drug ibuprofen (Ibu) and silver nanoparticles (AgNPs) for antibacterial properties. Tri-polyphosphate (TPP) was used to prepare the cross-linked chitosan nanoparticles, and the degree of crosslinking was varied in order to understand the effect of cross-linking density on the microstructure of the gel. Our results suggest a novel strategy and potential biomaterial for soft tissue engineering applications.

Parenting Measures: A Comparison of Three Widely Used Measures

Presenter: Kristine Melancon

Area of Study: Psychology

Advisor/Secondary Author: Valanne MacGyvers

School: University of Louisiana at Lafayette

Abstract:

In the Social Science literature, there are three popular measures of parenting style, that all loosely attempt to capture Diana Baumrind's (1966) dimensions of parental behavior. Those dimensions are a warmth dimension characterized by loving attention, emotional support, and encouragement towards autonomy, and a control dimension that demands mature behavior, self-control and respect for parental authority. The three measures are the Parental Authority Questionnaire (PAQ; Buri, 1991), the Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) and the Steinberg parenting measure (Steinberg, Lamborn, Dornbusch & Darling, 1992). The PAQ contains 30 retrospective items regarding mothers and 30 retrospective items regarding fathers and yields six subscales: Permissive, Authoritarian and Authoritative-Flexible for mothers and for fathers. Cronbach's alphas for these subscales were reported to be between .70 and .90. The PBI has 25 retrospective items and yields four subscales: Care and Overprotection for mothers and fathers. Test-retest for these subscales were reported to be between .48 and .68. Cronbach's alphas are not reported. In the Steinberg parenting measure (SPM), there are four subscales, a five-item mother responsiveness (Cronbach's alpha = .74), a five-item father responsiveness (Cronbach's alpha = .77), which are both part of the 15-item Parental Responsiveness scale, (Cronbach's alpha = .72), and a Parental Supervision subscale with 9 items (Cronbach's alpha = .76). All three measures were administered to a sample of 407 undergraduates (286 females; 118 males; 2 other; mean age 19.52)

Factor analysis is used to determine if PBI Care and SPM responsiveness are the same dimension. Similarly, PBI Overprotection and SPM Supervision should also tap into the same dimension. Regression and correlational analyses will examine the relations among the PAQ, the PBI and the SPM. Graphs convey the findings.

Polarization and d33 Experimentation of Carbon Nano-Fiber/Piezoelectric Composites

Presenter: Christian Gary

Area of Study: Mechanical Engineering

Advisor/Secondary Author: Dr. Ahmed Khattab, Dr. Mohammed Madani, Daniela Cruz, Tyler Hacker, Anthony Simon

School: University of Louisiana at Lafayette

Abstract:

Piezoelectric ceramics are used for their sensing capabilities and power generation. These specific materials generate voltage potential under loading, allowing for development solutions such as push-start activated appliances, sonar-reliant devices, and acoustic instruments. Innovations utilizing piezoelectric materials include alternate energy sources like kinetic energy storage through roadway, railroad, and sidewalk implementation. Lead zirconate titanate (PZT) ceramics, a particular form of piezoelectric material, has distinct energy conversion functions.

Likewise, nanomaterials, like carbon nano-fibers (CNF), possess optimal performance capabilities due to their good interfacial bonding with the matrix materials. In this study, electric material output testing was performed on composites consisting of PZT and CNF, due to CNF's superior composite enhancements, to find the piezo-electrical effects.

PZT/CNF composite disc samples were made by mixing pre-measured CNF and PZT and pressing each of the mixtures in a cylindrical mold before cooking them. In order to concentrate their electrical poling pathways, each sample was subjected to high electrical fields under high temperatures to lock their material electrical potentials. The developed CNF/PZT samples were subjected to vertical forces that activated the materials' charge output. Each mixture had a different percentage of CNF in it, allowing for the examination of the difference in production of charge based on the amount of CNF it contained. The amount of charge produced in the test material due to applied dynamic load known as the d_{33} value. These d_{33} values were found to increase with higher CNF concentration.

Porous Scaffolds Composed of Chitosan, Collagen, and Hydroxyapatite for Use in Cancer Therapy Studies

Presenter: Katelyn Musumeche

Area of Study: Chemical Engineering

Advisor/Secondary Author:

School: University of Louisiana at Lafayette

Abstract:

One of the main obstacles in the initial phase of cancer therapy research is the creation of a three-dimensional environment which adequately mimics the environment of cancer cells in the human body. Historically, the testing of potential cancer therapies has been done in two-dimensional spaces, such as a petri dish. This two-dimensional evaluation does not allow for the considerations that human bones are both three-dimensional and highly porous. The fabrication of an environment that closely resembles the extracellular matrix (ECM) of human bone is crucial to the study of interactions between cancer cells and normal cells inside the body. This project focuses on creating such an environment to study the ECM interactions between breast cancer cells and osteoblasts. Three dimensional scaffolds were created using chitosan (CS), a natural biopolymer, collagen (CO), and hydroxyapatite (HAp) to optimize the mechanical and biological properties of the scaffolds. Glutaraldehyde (GLU) was used as a cross-linker between the CS and CO biopolymers and the GLU concentration level was varied in order to achieve the optimal concentration for mimicking the mechanical and physical properties of the ECM of human bone. The CS-CO-HAp scaffolds were prepared using lyophilization techniques to create porous scaffolds. Physical properties studied were water absorption, retention, and swelling. Enzymatic degradation was also studied in order to determine the effects of crosslinking on the scaffolds. Scanning electron microscopy (SEM) and confocal microscopy were utilized to study porosity, pore size, and pore interconnectivity. The physical properties of the scaffolds are a crucial part of the project for truly and accurately mimicking the ECM. Our goal for this project is to create a three-dimensional environment to be used for cell culture to study the ECM interactions of bone cells and breast cancer cells in a laboratory setting. The scaffolds created

in this project will be used in future studies to evaluate changes in the ECM before, during, and after cancer treatment therapies.

Potential Power-Conflict in the Workplace or at Home

Presenter: Allison Thomas

Area of Study: Sociology

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

According to Wee, (2017, P. 2375), future research should examine the potential power conflict between the leader and the follower in the home or workplace. The purpose of this presentation is to empirically explore potential power conflict between the leader and the follower in the home and workplace. The research question that will be addressed What is the potential power conflict between the leader and the follower in the home or workplace? Results will be shared from interviews and focus groups with working adults.

Psychological Well-Being and Hookup Behavior in College Students

Presenter: Mia Comeaux and Dylan A John

Area of Study: Psychology

Advisor/Secondary Author: Amy Brown, Eva Lieberman

School: University of Louisiana at Lafayette

Abstract:

Hooking up is a common phenomenon that occurs on college campuses. Hookups often involve behaviors ranging from fondling and kissing to penetrative sex. Extant research has shown that the effects of hookups vary by gender: men who hookup more frequently have higher psychological well-being (PWB) whereas women who hookup more frequently have lower PWB (Fielder & Carey, 2010; Grello et al., 2006; Owen, et al., 2010). The current study aimed to compare hookup frequencies and PWB by gender in a college sample. Analyses were conducted on a sample of 205 participants (80.9% Female). Students completed questionnaires to evaluate current PWB, including the Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995), the Rosenberg Self-esteem Scale (RSES; Rosenberg, 1965) the Satisfaction with Life Scale (SWL; Pavot & Diener, 1993) hookup frequency, perceptions of hookups. Of participants, 36% report hooking up at least once. Analyses show a significant positive association between hookup frequency and satisfaction with life and higher self-esteem among men, this is consistent with prior research. There was no statistically significant association between women's hookup frequency and PWB.

PTSD Symptoms as a Mediator of the Relation between Adverse Childhood Experiences and Somatic Symptoms

Presenter: Mikaila Kinsland; Bailey Latiolais; Nicholas Barker; Madison Holmes

Area of Study: Psychology

Advisor/Secondary Author: Dr. Hung-Chu Lin

School: University of Louisiana at Lafayette

Abstract:

Mounting research has informed the relations between childhood trauma and adult physical functioning; the mechanisms underlying the relations, however, remain unclear. Identifying mechanisms linking childhood trauma and poor health outcomes is important to effective interventions and preventative strategies. Recent research has pointed to posttraumatic stress disorder (PTSD) as a potential factor through which childhood adversity relates to physical health symptoms. The purpose of this study was to examine the relation between adverse childhood experiences (ACEs) and somatic symptoms in adulthood; as well, the study examined the role of PTSD symptoms in the association of ACEs with somatic symptoms. A sample of 482 college students responded to an online survey, including (1) the Adverse Childhood Experiences scale, examining childhood trauma that occurred prior to one's eighteenth birthday, (2) the Cohen-Hoberman Inventory of Physical Symptoms, assessing participants' somatic symptoms experienced during the last two weeks, (3) the Depression Anxiety Stress Scales, evaluating current symptoms of depression, anxiety, and stress, and (4) the Life Events Checklist for DSM-5, determining direct or indirect exposure to a variety of Criterion A traumatic events, and (5) the Posttraumatic Stress Disorder Checklist for DSM-5, evaluating DSM-5 symptoms of PTSD. The results revealed an indirect pathway from ACEs to somatic symptoms through PTSD symptoms above and beyond all covariates, including gender, Criterion A trauma, depression, and anxiety. The findings carry implications for prevention and intervention programs aiming at ameliorating the harmful effects of ACEs on adult somatic symptoms.

Removal of Sulfur Contaminants from Natural Gas Streams

Presenter: Alex Zappi

Area of Study: Chemical Engineering

Advisor/Secondary Author: William Holmes, Jerry Conerly, Rafael Hernandez

School: University of Louisiana at Lafayette

Abstract:

Due to environmental policies becoming more stringent in recent years, there has been a need to develop more efficient and effective methods of removing sulfur contaminants from natural gas sources worldwide. Hydrogen sulfide is the foremost problematic compound in such streams along with low chain mercaptans. To this end, research was conducted on testing the effectiveness of different iron oxides sourced from different parts of the world. A model flow stream consisting of bulk methane fortified with 500 ppm hydrogen sulfide, 50 ppm methyl mercaptan, and 50 ppm ethyl mercaptan was introduced to a catalyst bed using a matrix of different parameters: temperature, pressure and flow rates. Analysis of the effluent was conducted using an online GS-MS with sampling occurring every 26 minutes. The sulfur contaminants' concentrations were tracked until breakthrough had occurred. Results showing

optimized operating conditions, breakthrough, and surface analysis compared to current commercial products will be presented. This proprietary catalyst provided removal for approximately 240 hours while the commercial brand provided approximately 20 hours of removal before breakthrough.

Robust Resource Allocation Model Using Edge Computing for Delay Sensitive Tasks in Vehicle to Infrastructure (V2I) Networks

Presenter: Anna Kovalenko

Area of Study: Computer Science

Advisor/Secondary Author: Mohsen Amini Salehi, Razin Farhan Hussain, Omid Semiari

School: University of Louisiana at Lafayette

Abstract:

Development of autonomous vehicles is one of the most ambitious and promising projects in human history. Such vehicles require agile and reliable services to manage hazardous road situations. Vehicular Networks is the technology that can provide high-quality services for self-driving vehicles. A large percentage of service requests in these networks have an urgent nature (e.g., disaster updates, hazard alerts, etc.) In other words, these requests are delay intolerant and require immediate service. Therefore, Vehicular Networks, and particularly, Vehicle-to-Infrastructure (V2I) systems must provide a consistent real-time response to autonomous vehicles. During increased traffic congestion or even natural disasters, it can be particularly tricky for (V2I) systems to maintain an optimal performance level. In such situations, a surge of requests arriving at a Base Station (a network edge device with computing capabilities) can drastically decrease (V2I) system response time. The consequences of even a millisecond delay for an urgent request can be dangerous, sometimes fatal. Hence, the goal of our research is to increase robustness (i.e., ability to maintain optimal performance) of the (V2I) systems. To achieve this goal, we offer a resource allocation model that can load balance (i.e., dynamically utilize resources from neighboring Base Stations), when the system is oversubscribed (experiencing an unusually dense service requests arrival). We propose an allocation algorithm based on a calculated probability of the arriving request to be served in time on several neighboring Base Stations. We introduce a Load Balancer component which assigns the request to the Base Station with a maximum precomputed probability. After all, we evaluate our model under various oversubscription levels and urgent requests percentages. Simulation results demonstrate that the proposed model decreases overall service miss rate by up to 20 % and urgent requests miss rate by up to 50 %.

Scanning Transmission Ion Microscopy at Louisiana Accelerator Center

Presenter: Nicholas Henderson

Area of Study: Physics

Advisor/Secondary Author: Dr. Harry Whitlow, Dr. Naresh Deoli

School: University of Louisiana at Lafayette

Abstract:

Direct scanning transmission ion microscopy (direct STIM) at the Louisiana Accelerator Center (LAC) is a potential useful tool for imaging thin biological tissue samples. In STIM a proton or He nucleus is sent through a thin sample and the energy loss measured as the beam is scanned over the sample. STIM can be used alongside with Rutherford backscattering spectroscopy (RBS) and Proton Induced X-ray Emission (PIXE) as part of a complete system for analysis and imaging. The setup is suitable to image and analyze biological tissues. Our goal is to image the structure of individual cells and of biological tissue. The development is being carried on cells and tissues from the tissue archive at the New Iberia Research Center (NIRC).

The STIM system consists of a detector holder that was designed to hold detectors 40 mm from the sample and machined from a piece of aluminum. The holder has a space for both the off-axis STIM (30°) and the direct STIM at 0° detectors as well as a Faraday cup to measure beam currents. The diodes and cup are mounted on thin plastic insulating rings that create a tight fit and avoid short circuiting. The holder is mounted to a manipulator arm, and the diodes are wired to two separate electrical leadthroughs that connect to the electronics chain.

The 1.7 MV Pelletron accelerator at the Louisiana accelerator center is used to provide 2 MeV energy proton beams. The measurements are done in the target chamber of a MeV ion microprobe (μB1). This uses an Oxford triplet lens system to focus the beam down sizes of a μm or so. The imaging works by scanning the beam over the sample and measuring the energy loss for each particle.

Soil-Geopolymer Mixtures Using Reclaimed Asphalt Pavement Materials for Pavement Base and Sub-base Layers

Presenter: Makarios Abader

Area of Study: Civil Engineering

Advisor/Secondary Author: Dr. Mohammed Jamal Khattak

School: University of Louisiana at Lafayette

Abstract:

The recycling of removed and/or reprocessed pavement materials containing asphalt and aggregates has become an applicable practice to investigate, particularly in its application in road construction. A study is conducted to test the feasibility of using reclaimed asphalt pavement aggregates (RAP) mixed with fly ash and an alkali activator as an alternative to soil cement in road base or sub-base applications. The resulting product referred to as soil-RAP geo-polymer is made by varied mix constituents of fly ash, RAP and a ratio of sodium silicate and sodium hydroxide. Moreover, the influence of mixture variables on the mechanical properties of soil-RAP geo-polymer is investigated through an experiment design under two fly ash types. Models to predict the unconfined compressive strength (UCS) based on mixture

parameters are established with results showing the addition of RAP improving the mechanical properties of the soil-RAP geo-polymer mixture.

Solar Cell Testing with Lock-In Thermography (LIT)

Presenter: Lelia Deville

Area of Study: Mechanical Engineering

Advisor/Secondary Author: Dr. Terrence Chambers, Dr. Kary Ritter, Deepak Jain
Veerendra Kumar

School: University of Louisiana at Lafayette

Abstract:

Lock-In Thermography is a form of nondestructive testing that allows for testing of electronic devices (such as solar cells) to be reviewed and monitored for defects. In this presentation, the basics of Lock-In Thermography are explained. Examples of images from both defective fully functioning thin film solar cells of various kinds are analyzed. The need for such testing in the Solar Lock-In Thermography lab and the importance of this tool to the Solar Program at the University of Louisiana at Lafayette is discussed.

Solar Power at UL Lafayette

Presenter: Erin Landry

Area of Study: Mechanical Engineering

Advisor/Secondary Author: Dr. Kary Ritter

School: University of Louisiana at Lafayette

Abstract:

Solar power is a necessary part of the lives of the future. Without it, the Earth will run out of ways to power the countless things relied on during a daily basis. UL Lafayette is doing extensive research to improve the feasibility of solar power in Louisiana, and their research is crucial. Overall, solar power is the power of the future. The researchers focusing working on these plants are providing important information to the people of UL, as well as the community and the world.

Strategies to increase biohydrogen production from lignocellulosic biomass from dark fermentation

Presenter: Shayla LeBoeuf

Area of Study: Chemical Engineering

Advisor/Secondary Author: Emmanuel Revellame, Remil Aguda, Donald Blue

School: University of Louisiana at Lafayette

Abstract:

To meet growing domestic energy demands, research on biohydrogen production from lignocellulosic biomass as an alternative source of fuel has been explored. Acid pretreatment of biomass produces sugars for the production of biohydrogen by dark fermentation, but also produces compounds that inhibit, or prevent, microbial biohydrogen production. To increase the yield, the inhibitors need to be removed or minimized. Among the strategies, removal of the

inhibitors by adsorption or minimization of inhibitor production by alkaline pretreatment of biomass have been experimentally demonstrated. Previous studies have shown that different types of inhibitors are detrimental to biohydrogen production. Removal of the inhibitors and employing alkali pretreatment seem to be promising strategies to remove or minimize their effects on biohydrogen production.

Synthesis of Mesoporous Metal Oxides

Presenter: Elizabeth Fox

Area of Study: Chemistry

Advisor/Secondary Author: Hui Yan, Lingyiqian Luo, Stefanie R Rodrigue

School: University of Louisiana at Lafayette

Abstract:

Cerium compounds have been found to be good catalysts for the water-gas shift reaction in the context of fuel-burning machines. It also has the added benefit of not being toxic to living things, as well as more readily available than other lanthanides. The nanocasting method is used in order to synthesize the compound with ordered structure, using KIT-6 or SBA-15 as a template for the cerium nitrate, using 200 proof ethanol as the solution, and calcinating the dried powder. BET analysis is used in order to determine the surface area, and RAMAN spectrometer is used in order to characterize the synthesized compounds. Mesoporous metal oxide ceria has been successfully synthesized.

The Concrete Ceiling: Contributing Factors That Impede The Promotion of African-American Women To Executive Positions In Corporations

Presenter: Imari Eaglin

Area of Study: Business Management

Advisor/Secondary Author: Dr. Vanessa Hill

School: University of Louisiana at Lafayette

Abstract:

The purpose of this research is to identify and explore the factors that influence the advancement of African-American women in corporations. This paper explores why qualified African American Women are rarely promoted to senior management positions in companies. A literature review identifies different opinions, perspectives, and conflicting conclusions reached by social scientists, business journalists, and African-American women relating their workplace experiences. Literature in the popular business press and research identifies several factors that result in significant barriers to advancement for black women. Characteristics that reinforce racial identity such as skin tone, hairstyle and name are among the factors identified as barriers for advancement for African American women. A pilot study is done to examine the impact of these characteristics on advancement opportunities for African American women. The main goal is to identify factors that contribute to black women's success and failure resulting in promotion to senior management.

The Effect of Circadian Rhythms on Penalties in the National Football League

Presenter: Keli I. Doles

Area of Study: Kinesiology

Advisor/Secondary Author: Jeremy J. Foreman

School: University of Louisiana at Lafayette

Abstract:

Humans have peak performance times based on circadian rhythms, which may pose disadvantages for people trying to perform at a high level in different time zones. The purpose of this study is to determine if this disadvantage affects penalties accrued in NFL football games. From 2009-2015, 890 penalties were called in games where Pacific Time teams played in Eastern Time zones before 2pm Eastern Time. Of those penalties, 44.5% were called on the Eastern home teams and 55.5% were on the Pacific away teams. However, in a smaller sample of late games, more penalties are called on the away (Pacific) teams (i.e., 54.8% of penalties). Therefore, it appears that the away teams accrue more penalties than the home teams; however, a more thorough examination is needed.

The Effectiveness of Antibiotics and Household Chemicals Against Microbes in Condensate from an Attic Air Conditioning Unit

Presenter: Andre Davis

Area of Study: Microbiology

Advisor/Secondary Author: Chris Struchtemeyer

School: McNeese State University

Abstract:

Microorganisms are known to produce biofilms on the coils of attic air conditioning units. Cells from these biofilms are shed during the summer when the units begin to produce excess amounts of condensation. This condensation carries the microorganisms from coil biofilms into a water pan, which is located just below the air conditioning unit. The water in this pan, which is typically referred to as condensate, flows to the exterior of the building through PVC piping. Previous studies have observed Legionella species and a variety of multidrug resistant bacteria in condensate, which clearly shows that attic air conditioners harbor potentially serious pathogenic bacteria. In addition to their disease causing capabilities, these microbes can also clog the PVC pipes that are used to carry condensate from the drain pan to the outside of the building, which often leads to overflows and failures of attic air conditioner units. In spite of these observations, very few studies have evaluated the effectiveness of chemicals that are commonly used to treat clogged condensate pipes. In this study biofilms samples were collected from a residential attic air conditioning unit with a chronically clogged condensate line. The goals of this work were to determine whether: 1) The biofilms contained multidrug resistant bacteria and 2) Bleach, vinegar, and store bought air conditioner pan tablets were effective against whole biofilms and the individual bacterial species within the biofilms. The results of this work showed that multidrug resistant bacteria were not present in condensate biofilms. The results also indicated that bleach was most effective for treating individual species of biofilm bacteria, whereas store bought pan tablets most effectively controlled the growth of whole

biofilms. Minimum inhibitory concentration data was also obtained for bleach, vinegar, and pan tablets, which should help prevent future overflows and failures of attic air conditioning units.

The Effects of Artificial Limbs on Sprint Times in Professional Athletes

Presenter: Shannon A. Barrow

Area of Study: Kinesiology

Advisor/Secondary Author: Jeremy J. Foreman

School: University of Louisiana at Lafayette

Abstract:

The participation of disabled athletes in sports has steadily increased due to the technological advancements of assistive devices. The Paralympics have allowed these athletes the opportunity to compete, but amputated sprinters that wish to compete against their able-bodied competitors have brought controversy to the world of sports. The purpose of this study is to determine the effects of artificial limbs on sprint times in professional athletes. Paralympic and Olympic data from 1988 to 2016 is examined. Able-bodied competitors perform better than amputated athletes in all sprint events. It appears that prosthetic legs do not provide an advantage, but further metabolic and biomechanical analysis would be beneficial.

The Effects of Criminal History on the College Application Process

Presenter: Brandon Hamann

Area of Study: Criminal Justice

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

Research has indicated that future studies should focus on institutional responses to student criminality. The purpose of this presentation is to examine the procedural responses of institutions of higher education with regards to student criminality. The research question that will be addressed is "What are the procedural responses of institutions of higher education with regards to prior student criminality?" Results from focus groups and interviews will be discussed.

The Effects of Ingesting Malathion Exposed Insects on Green TreeFrogs (Hyla cinerea)

Presenter: Breanna Porche

Area of Study: Biology

Advisor/Secondary Author: Dr. Heather Birdsong

School: University of Louisiana at Lafayette

Abstract:

Every day, our environment receives input of chemicals humans have developed and engineered to increase crop yields, reduce pest species, or as byproducts of industry. One of the most commonly used chemicals in suburban areas are insecticides. The purpose of this study is to investigate the effects of a commonly used insecticide on a predatory species to help

better understand the outcomes of these chemicals on our environment and the animals living in it. Frogs are insectivores that are considered indicator species of ecosystem health, as they are uniquely sensitive to contaminants. This study will use Green Tree Frogs (*Hyla cinerea*) that were caught from the wild as our experimental subjects. They will be housed individually in the laboratory and offered crickets coated with Malathion, a type of organophosphate commonly used to kill insects in home gardens and agricultural fields. They will be fed exposed crickets on two occasions and observed for changes in behavior and movement after feeding that may indicate neurological damage. Two days after the second exposure they will be humanely euthanized, their liver weight and condition recorded, and blood samples will be taken for hematology analysis of white blood cell count. We hypothesize that secondary exposure to malathion will have some negative effect on the overall health of the frogs. These findings may be useful in future management of insecticide use.

The Effects of Paternal Incarceration and Middle -Class Family

Presenter: Urselia Johnson Leblanc

Area of Study: Criminal Justice

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

According to Turney (2017), future research should examine the unequal consequences of middle-class children whose fathers have been incarcerated. The purpose of this presentation is to determine the unequal consequences of the middle-class children whose fathers have been incarcerated. The research question that will be examined is "What are the unequal consequences for middle class current adults that was children whom became impacted by parental incarceration?" Results will be shared from interviews and focus groups from adults whose fathers were incarcerated as children.

The Mechanism of Dimethyl Sulfoxide (DMSO) in Enhancing Tentacle Regeneration in Nematostella Vectensis

Presenter: Ada Tusa and Kymber Bly

Area of Study: Biology

Advisor/Secondary Author: Dr. Patricia Mire

School: University of Louisiana at Lafayette

Abstract:

"*Nematostella vectensis*, the starlet sea anemone, is a model organism used in genetic, developmental, and physiological studies (Putnam, et al., 2007). In the present study, *Nematostella vectensis* is examined for its ability to undergo tentacle regeneration. Previous studies using dimethyl sulfoxide (DMSO) as a solvent showed an increase in tentacle regeneration rates when compared to the seawater controls (Puckett and Tusa, 2017). Here, we set out to determine the minimum required incubation time of DMSO to produce enhancement in tentacle regeneration rates. This was achieved by conducting a series of time trials in which animals each were treated with 0.2% DMSO solution for either 1, 3, 6, 12, 24, or 36 hours. The

animals were also assessed for their memory of DMSO treatment by conducting a repeat excision of tentacles. To investigate the mechanism of DMSO, electroporation was used to alter membrane permeability and observe its effect on regeneration rate. Results indicate that animals treated with a 3 hour incubation of DMSO experienced the fastest rate of regeneration when compared to the other experimental groups in the time trial. Furthermore, animals from the 1 and 3 hour incubation groups evaluated for memory of DMSO produced repeat regeneration rates comparable to their original respective groups. The regeneration rates for the 3 hr DMSO treatment group and the electroporation group of $1,000 \mu\text{F} \times 30\Omega$ were not significantly different, indicating an enhanced effect on regeneration rate by electroporation. This suggests that DMSO's ability to alter membrane permeability changes the electrochemical gradient of ions in the cells, leading to enhanced tentacle regeneration in *Nematostella vectensis*. These experiments establish an optimal DMSO incubation time, indicate memory of DMSO treatment, and suggest that the regeneration of tentacles is affected by a pathway sensitive to membrane permeability."

The Missing Media: Determining the Relationship Between Missing Persons Cases and Media Coverage

Presenter: Margaret Storms

Area of Study: Criminal Justice

Advisor/Secondary Author: Dr. Michelle Jeanis

School: University of Louisiana at Lafayette

Abstract:

The media possesses a major influence in our daily exposure to information pertaining to the world around us. When it comes to missing persons, information sharing is vital to the outcome of the case. However, some cases get much more attention than others. While some missing persons cases reach levels of national or even international news coverage, many missing persons go without a single article written about them. In those cases, the missing persons are given much less of a chance of being found than if their disappearances had been given any media exposure at all. This study aims to answer why there is such a disparity in media coverage of missing person cases. By analyzing every piece of news coverage for each missing person case across the country spanning decades, results may point toward certain characteristics of missing persons and their cases that affect the amount of media coverage they and their cases receive. Once knowing which characteristics negatively correlate with media coverage, steps can hopefully be taken to change how and what the media reports.

The Nautical History of Lafourche-Terrebonne

Presenter: Gwyneth Engeron

Area of Study: History

Advisor/Secondary Author: Dr. John P. Doucet

School: Nicholls State University

Abstract:

The first mass settlement of Lafourche and Terrebonne Parishes occurred in 1785 with the arrival of “second coast” Acadians. The Second Acadian Coast, which extended northward toward Baton Rouge and southward toward historical Lafourche Crossing, refers to the riverine highland where the single largest immigration of Acadian exiles in North American history settled. Upon exile, this group of about 3000 sought repatriation in France for thirty years before journeying to Louisiana in 1785 to join previous Acadian settlers. They arrived from France at the port of New Orleans on the famous “Seven Ships,” and from the city most settlers were distributed by the Spanish territorial government to settle the Second Coast region. Modern historical references suggest that Lafourche-Terrebonne (known in 1807-1822 as “Lafourche Interior Parish”) was settled primarily from passengers of one of the ships, namely the frigate l’Amitie. We extracted and transcribed 1785 disembarkment data from historical records, as well as geographical land ownership from the 1810 U.S. Census, to determine the graphical distribution of Acadian settlers from the Seven Ships. Surprisingly, the 1810 settlement of Lafourche-Terrebonne is diverse, with settlers from each of the Seven Ships and predominantly from the St. Remi (not l’Amitie). In addition, the majority of settlers to the new region derive from areas not associated with the Second Coast immigration. Our results shed new light on primary Lafourche-Terrebonne settlement, as well as a new appreciation for the diversity of influences that shaped modern communities and what became the prevalent Cajun culture of the region.

The Optimum Bond Strength of Geo-Polymer Cement

Presenter: Nicholas R Scalfano

Area of Study: Civil Engineering

Advisor/Secondary Author: Dr. Mohammad Khattab, Syfur Rahman

School: University of Louisiana at Lafayette

Abstract:

This research investigates the effect of different parameters (aggregate roughness, $\text{Na}_2\text{SiO}_3/\text{NaOH}$ ratio, NaOH molarity on the bond strength of geo-polymer, and different types of aggregates) in the creation of an optimum strength geo-polymer cement. The bond strength between geo-polymer matrix and specific aggregates is significant and contributes to the strength of the composite material strength. Beam samples were prepared and tested under a four point bending test to extract flexural bond strength data. The data found that lime stone, aggregate roughness created by sand paper #80, a $\text{Na}_2\text{SiO}_3/\text{NaOH}$ ratio of 1, and NaOH of 10M proved to be ideal for flexural strength. By optimizing the bond behavior of geo-polymer cement precise and consistently, the strength can be obtained.

The Spatial Pattern of Element Distribution in an Actively Growing Soybean Root.

Presenter: Sharena Thibodeaux and A'Ishah Trahan

Area of Study: Biology

Advisor/Secondary Author: Aniruddha Acharya, Akim Mitoumba, Sage D Banks

School: University of Louisiana at Lafayette

Abstract:

The development and growth of a plant depends on healthy development of roots. They are responsible for anchorage, storage of reserve carbohydrates, absorption and transport of solutes. Roots encounter various environments; regardless of the environment they grow they have to maintain a certain ionic environment within the cell for metabolic process to occur at an optimal rate. Element compartmentation plays a major role in the process, where toxic elements or the elements which are excess within the cell are isolated or compartmentalized within the vacuole to maintain a certain concentration within the cytoplasm for the biological metabolic process to occur. To understand compartmentation, we observed the spatial patterns of element distribution in soybean roots. Soybean is a widely used legume grown across the world with USA being the top producer. It is a high food value crop and used for oil seed, human food, animal consumption and biofuel production. We studied the endogenous element distribution of an actively growing soybean root using cryo-SEM/EDS. Our results indicate that the potassium and phosphorous distribution in a soybean root is tissue specific and depends on the developmental stage of the root. We also found a certain degree of symmetry in the pattern of distribution that compliments the anatomical features of the root.

Torrefaction of Biosolids to Produce Biocoal with Improved Solid Fuel Properties

Presenter: Joshua Fontenot

Area of Study: Chemical Engineering

Advisor/Secondary Author: Dr. Prashanth Buchireddy, Timothy Boudreaux

School: University of Louisiana at Lafayette

Abstract:

Coal accounts for about 15% of the US energy consumption. As environmental regulations become stricter, coal-fired power plants are required to mitigate the negative impact that flue gases produced by the combustion process have on the environment. One option is to blend fossil fuel derived coal with cleaner burning "biocoal", a renewable solid fuel. Biocoal is typically produced from lignocellulosic materials such as hard wood, soft wood, energy crops, etc., via torrefaction, a low-temperature pyrolysis process (240 – 300 oC). Torrefaction of biomass produces a material which has higher energy density, is hydrophobic in nature, and is easier to grind compared to biomass. However, torrefaction of non-lignocellulosic materials, which are energy rich, has not been investigated extensively. Biosolids are one such non-lignocellulosic material that has tremendous potential to be used as a solid fuel source. Over 6.5 million dry metric tons of sewage sludge are produced every year, potentially allowing an abundant waste source to be converted into an energy dense product as opposed to being disposed of in landfills. The goal of this project is to evaluate the potential use of biosolids to produce energy dense solid fuel utilizing the torrefaction process. A bench scale system was designed and set up used to perform torrefaction tests and accommodate testing various operational parameters

(temperature, residence time, inert gas flow rate, etc.). Tests were conducted to evaluate the effect of operational parameters on properties of torrefied biosolids. Reactor temperature was varied to evaluate its effect on solid mass yield, energy yield, and the material properties of torrefied biosolids including higher heating value, elemental composition, ash content, volatile matter, moisture and fixed carbon content. A higher heating value of 32.2 MJ/kg, which is roughly equivalent to anthracite coal, was produced when operating the reactor at 300 °C with a 30 minute residence time.

Torrefaction of Biosolids: Mass Spectrometry Elucidation of Product Gases

Presenter: Logan Pritchett

Area of Study: Chemical Engineering

Advisor/Secondary Author: William Holmes, Prashanth Buchireddy, Timothy Boudreaux

School: University of Louisiana at Lafayette

Abstract:

Sewage sludge is produced from wastewater at a rate in excess of 6500 thousand dry metric tons per year. Currently in the U.S., much of the biosolids generated from the sludge are taken to landfills for disposal and are not being utilized. These biosolids contain combustible organic matter that has the potential to be used as a “green” fuel. Utilizing the torrefaction process, (a mild form of pyrolysis), biosolids can be converted into a coal like substance (biocoal). This product can be potentially blended with and co-fired with fossil fuel coal for the production of electrical power. In addition to the “biocoal” product, the torrefaction process produces gases generated from the partially devolatilized biomass. This gas stream can be recovered and used to heat the torrefaction reactor, provided it contains sufficient heating value, which would save on the costs of operation. The goal of this study was to utilize mass spectrometry to elucidate the chemical compounds in the product gas stream to determine heating values. Results from Gas Chromatograph Mass Spectrometry (GC/MS) including both Election Impact (EI) and Chemical Ionization (CI) will be presented establishing the molecular weight of products and tentative identification of gas products from the process.

Torrefaction of Sewage Sludge to Increase Energy Characteristics

Presenter: Joshua Worley

Area of Study: Chemical Engineering

Advisor/Secondary: Dr. Prashanth Buchireddy

School: University of Louisiana at Lafayette

Abstract:

As the global population continues to rise so does demand for energy and fuel products. This demand is currently met with non-renewable fossil fuels and their derivatives even amid rising concerns about supply and the environmental effects burning fossil fuels has. According to the Global Energy Statistical Yearbook, CO₂ emissions rose by 2.1% in 2017 alone. Further, other environmental toxins are released during fossil fuel consumption such as nitrogen oxides and sulfur dioxide which cause rainwater acidification and habitat destruction. This ongoing increase of pollutants in the atmosphere affects everything from climate change and weather patterns, to the amount arable land and ocean acidity. Socio-environmental concerns notwithstanding, there is another large problem with fossil fuels: they are

completely non-renewable and are being produced at an unsustainable rate. Thus, it is essential that cleaner, safer, and renewable sources of fuel be found to meet and exceed this increasing demand. Each year, massive amounts of waste are produced in industry, agriculture, and municipalities, and much of this waste is disposed of in unsustainable and non-environmentally friendly ways. This waste generally falls into two categories: lignocellulosic and non-lignocellulosic, each with their own unique benefits and challenges as sources of sustainable and economic energy production. Sewage sludge is a large and ever-increasing part of this waste which is currently only used for agricultural fertilizer or is land-filled-both at significant cost to municipalities and waste management companies. However, this sludge is very energy rich; thus, it constitutes a large, cheap, non-utilized, and increasingly interesting material for fuel conversion research. Torrefaction is a promising process of producing coal like products from this sludge which can be blended and co-fired in industrial power and chemical production processes. Therefore, the goal of this study was to determine the properties of sewage sludge after torrefaction and to discover how changing process parameters changes the fuel properties. Further, this study aimed to determine the viability of recycling gasses produced during the process to supplement the fuel required for drying and reaction heating. In terms of process economics, such recycling and self-sustainability could be vital to industrial torrefaction operations.

Using Forensic Psycholinguistics to Explore the Thoughts of a Mass Murderer: A Preliminary Analysis

Presenter: Hope A. Marceaux and Robine Gonzalez

Area of Study: Psychology

Advisor/Secondary Author: Dr. Brooke O. Breaux, Sara Kujawski

School: University of Louisiana at Lafayette

Abstract:

During the summer of 2015 in Lafayette, Louisiana, John Russell Houser committed a public mass shooting. Based on Knoll's (2012) interpretation of mass murderers, Houser's outward behaviors were most aligned with the adversarial homicide-suicide subtype. Following the crime, police officers recovered a forty-page notebook in his hotel room that contained what is presumed to be his handwritten thoughts. By conducting a preliminary content analysis of the phrases contained in Houser's journal, we sought to determine whether Houser's inner thoughts also aligned with adversarial homicide-suicide subtype. To accomplish this task, we formulated operational definitions for each homicide-suicide subtype characteristic. This preliminary analysis suggests that the phrases in Houser's journal are consistent with the adversarial homicide-suicide subtype; however, the results of this analysis raise further questions about the nature of thought. We argue that what might really matter are not the thoughts themselves but, rather, the degree to which these thoughts influence our behavior.

What's Stopping Us: Teacher's Perception on Obstacles Facing African-American Males and the Effects on Academics

Presenter: Kevin Coleman

Area of Study: Sociology

Advisor/Secondary Author: Ashraf Esmail

School: Dillard University

Abstract:

According to Scott, Taylor, Palmer (2013) further research should examine teacher perceptions of the challenges and obstacles among African American male high school students and its impact on academics. The purpose of this presentation is to examine teacher perceptions of the challenges and obstacles among African American male high school students and its impact on academics. The research question that will be addressed is "What are teacher perceptions of the challenges and obstacles among African American high school male students and its impact on academics?" Results from both interviews and a focus group with secondary teachers will be shared.

Schedule for Oral Presentations

SATURDAY, NOVEMBER 17, 2018

Session 1: 8:30 AM – 9:45 AM

2 Presenters = 30 min./each

3 Presenters = 20 min./each

Session 1, ROOM #1: Bayou Room

Presenter: Mark Mallory, Zachary Henry; *History*

Title: ***UNDERWATER: The 2016 Floods Project***

Advisor/Secondary Author: Liz Skilton

School: University of Louisiana at Lafayette

Abstract:

Disaster is a recurring problem in Louisiana history. From quick-onset floods and hurricanes to slow-onset coastal erosion and natural decay, the state has become the site of tumultuous catastrophe in the past decade. Over the past year, we have been working on collecting oral histories related to these recent Louisiana disasters while memories of them are still fresh. Our presentation will discuss our efforts to both preserve these histories and produce public history content in the form of podcasts, websites, and exhibits.

Presenter: Bethany Wright LeJeune; *Fine Arts*

Title: ***Robert Rauschenberg's Combines: An Examination of Coexistence***

Advisor/Secondary Author: Christopher Bennett

School: University of Louisiana at Lafayette

Abstract:

American painter Robert Rauschenberg was best known for his 'combines', paintings that contain three-dimensional elements. In a 1961 combine *Coexistence*, when the elements of the painting are individually examined, conclusions can be drawn about the nature of Rauschenberg's work as a whole and how this specific piece relates to the time period in which it was created. However non-confrontational Rauschenberg may claim to be, this paper contends that the common place objects such as a police barricade and dirty rag as well as the compositional arrangement of a crucifix against a white background in this combine show his support of the Civil Rights movement. By examining concepts presented by art historians Leo Steinberg and Brandon Joseph, as well as the curator responsible for organizing the Brooklyn Museum of Art's exhibition of 2014 titled *Witness*, Teresa Carbone, this paper pinpoints the intentions of Rauschenberg as an artist during the Civil Rights movement.

Presenter: Matthew Trahan; *Moving Image Arts*

Title: ***Objectification in Antonioni's "Eclipse"***

Advisor/Secondary Author: Christopher Bennett

School: University of Louisiana at Lafayette

Abstract:

Michelangelo Antonioni was viewed as a largely apolitical filmmaker by many of his contemporaries. He received criticism for examining the malaise of middle class and wealthy Italians instead of the working class protagonists often featured in Neorealist films. Despite this, however, Antonioni's focus was undoubtedly, albeit often indirectly, political, examining in detail, for example, the legacy and philosophical bases of fascism. In his film *L'Eclisse* (*Eclipse*), first released in 1961, Antonioni tackles this last subject, and others, I argue, through an examination of the subject object problem—the distinction between the observer and the observed. Subversively, Antonioni uses the language of film to imbue subjective qualities onto spaces; spaces in the film, as objects, are characterized by time, presence, and intuition. Space is independent, existing entirely without the aid of subjects, without people. If such a thing can be said about spaces, then the opposite could also be true. People, subjects, can become objectified; intimacy can be challenged and neglected. Subjects, for other subjects, can simply serve as a means to an end, as spaces too, despite their subjective qualities, may also be only a means to an end. At times lacking intuition and independence, Antonioni's protagonists and spaces become part of a larger meditation—rather than functioning in a merely descriptive way, they become the basis for a normative claim: that humans ought not be objectified in this way. Antonioni uses film to suggest that the process of objectification with reference to humans is unnatural and wrong, but also shows how humans are still subjected to it. Set in the EUR, a neighborhood that is itself part of the fascist legacy, Antonioni's film also looks into industrialization's effects on a reconstructed Italy.

Session 1, ROOM #2: Magnolia Room

Presenter: Madalyn Beyer; *Pre-Medicine*

Title: ***Using RNA interference to determine the role of epidermal carbonic anhydrase in post-ecdysial mineralization of crab carapace***

Advisor/Secondary Author: Dr. Enmin Zou

School: Nicholls State University

Abstract:

The use of crab shells as a model for innovative manufacturing shows great promise due to its remarkable properties. Many researchers have explored the use of chitin, which acts as “steel rods” for the crab shell, as a template for functional materials. This study, however, seeks to investigate the “cement” that is laid in between the chitin rods: calcium carbonate. Understanding its deposition following crab molting will help lay the foundation for development of underwater materials due to the crab shell's strong, non-toxic, and water-resistant properties.

It is hypothesized that epidermal carbonic anhydrase (CA) mediates the deposition of carbonate salts, such as calcium carbonate, to the post-ecdysial shell through generating bicarbonate ions. This hypothesis will be tested through investigation of changes in epidermal CA activity and calcium deposition to post-ecdysial shells after knocking down the CA expression, using RNA interference, and the blue crab, *Callinectes sapidus*, will be used as the model organism. A short sequence of double-stranded RNA targeting the CA mRNA will be injected into newly molted crabs to break apart the CA mRNA, and both epidermal CA activity and the metal content in crab shells will be examined. The changes in both enzymatic activity and exoskeletal metal content will give insight into the role played by epidermal CA in the assembly of crab shell “cement”. By exploring this unique process of crab shell formation, the scientific community can grow in its understanding of how crab shell can give a clue for manufacturing underwater materials.

Presenter: Claire Pierce; *Microbiology*

Title: ***Use of a plant growth-promoting rhizobacteria (PGPR) as biofertilizers on common garden plants of Southeast Louisiana***

Advisor/Secondary Author: Dr. Ramaraj Boopathy

School: Nicholls State University

Abstract:

Plant Growth Promoting Rhizobacteria (PGPRs) are bacteria that colonize the root system of plants and enhance plants' growth. This enhancement is attributed to the bacteria's participation in a symbiotic relationship with the plant in which the bacteria provides nutrients to the plant, and the plant provides a suitable environment for the bacteria to reside in the root nodule and in rhizospheric soil. PGPR's influence on the rhizosphere can affect the nutrient availability, nutrient uptake, and presence of other, potentially harmful, microbes. Though not yet economically viable, use of PGPRs as biofertilizers holds potential to have significant effects on plant growth and yield with fewer attributed environmental repercussions than the alternatives, e.g. overuse of commercial fertilizer. In this study, we implement a method of isolating potential PGPRs and assessing their biofertilizer potential. This process could produce PGPRs that are specialized to the environment in which they are collected from and could therefore work more efficiently if implemented in that same environment. Four unique rhizobacteria (*Citrobacter freundii*, *Citrobacter werkmanii*, *Providencia rettergi*, and *Alcaligenes faecalis*) were isolated from soil originating from an established garden in Southeast Louisiana. They were identified using Biolog method. Each species was researched to assess their potential to have PGPR effects. These isolates were used to create a bacterial consortium. A four week-long greenhouse trial was initiated to assess the extent of the PGPR abilities of the consortium. Bush green bean plants (*Phaseolus vulgaris*) were grown in soil inoculated with the consortium. The soil analysis showed the PGPR treated soil contained significantly higher amounts of ammonia, nitrate, and total heterotrophic bacterial counts compared to the controls. This will have significant impact on plant growth and biomass.

Presenter: Chris Oubre, *Pre-Medicine*

Title: ***Biodegradation of phenol by a bacterium isolate from the termite hindgut***

Advisor/Secondary Author: Dr. Ramaraj Boopathy

School: Nicholls State University

Abstract:

The subterranean Formosan termite *Coptotermes formosanus* is an insect pest in Louisiana that annually causes billions of dollars in damage. Some aspects of the microbiome of this termite, such as nitrogen fixation and methanogenesis, have been reported in literature, but more research is needed on factors affecting the termite microbial ecosystem. To our knowledge, the breakdown of phenolic compounds produced by lignin metabolism in the termite gut has never been reported.

In this study, termites were collected from wood of red maple *Acer rubrum*, tupelo *Nyssa aquatica*, nuttall oak *Quercus texana*, and live oak *Quercus virginiana* and the guts were removed. Termite gut samples were inoculated in different media with various substrates including phenol, glucose, and acetate. A bacterium, *Acinetobacter tandoii*, that used phenol as the sole source of carbon for growth was isolated and identified. This bacterium converted phenol to acetate via the production of metabolites catechol, cis-cis muconic acid, succinic acid, and oxalo acetate. Metabolically, the bacterium used the Krebs's cycle to produce TCA cycle intermediates from phenol. The bacterium survived high concentrations of phenol up to 300 mg/L and degraded all the phenol. However, at higher concentrations greater than 300 mg/L, a longer lag phase was observed in the bacterium's growth curve. This bacterium could potentially be used in the bioremediation of phenol contaminated soil and water.

Session 1, ROOM #3: Shadows Room

Presenter: Jessica Criddle; *Psychology*

Title: ***Self-Compassion and Valued Living***

Advisor/Secondary Author: Darryl O. Rachel, Dr. Emily Sandoz

School: University of Louisiana at Lafayette

Abstract:

Psychological flexibility and self-compassion have both been shown to positively impact psychological health and share many common factors. This study examined the association between psychological flexibility and living within one's values. Self-compassion was also investigated as a mediator of this relationship. Three self-report measures were used to explore these relationships in college students. It was found that psychological flexibility predicts achievement of values progress and that self-compassion fully mediates this link. Additionally, psychological inflexibility but not self-compassion was found to predict obstruction of valued living. This has implications for further research and the development of interventions on achieving valued living.

Presenter: April Pruitt, Ainsley Ellis, Kelsey Mayes; *Psychology*

Title: ***Can Mental Health Labels Change the Way People Think About Someone with Anorexia Nervosa?***

Advisor/Secondary Author: Dr. Brooke Breaux

School: University of Louisiana at Lafayette

Abstract:

Previous research suggests that the ways in which we describe people experiencing mental health issues can affect the way that others think, feel, and behave toward that person. Although mental disorders, such as schizophrenia, have been well explored (e.g., Read, Haslam, Sayce, & Davies, 2006), we were interested in investigating the mental health labels that are often associated with anorexia nervosa. More specifically, we ask whether the label selected to describe someone who meets the DSM-5 criteria for anorexia nervosa really affects how others perceive that person. We selected the labels mental illness, mental disorder, anorexia, and issue and conducted an online experiment in which college students were asked to read a story written by a female college student about her female roommate. Participants were then asked to answer questions posed by the female college student, and their answers to each question were analyzed using a between-subjects ANOVA. Even though the evidence suggests that not all perceptions were influenced by the particular label, there were several questions in which responses differed systematically depending on the label being used. Based on this data, we argue that a simple difference in label can change the way people think or feel about a person being described by that label; however, these difference are sometimes subtle and were not found in response to every question.

Session 2: 10:00 AM – 11:15 AM

Session 2, ROOM #1: Bayou Room

Presenter: Malika Taylor; *Business Management*

Title: ***Trends in Funding for Nonprofit Arts Organizations: A Regional Study in the Acadiana Area of South Louisiana***

Advisor/Secondary Author: Dr. Lise Anne Slatten

School: University of Louisiana at Lafayette

Abstract:

Nonprofit organizations (NPOs) have existed as a meaningful part of society for years and have been established to help and support various causes. These organizations provide a variety of services for people who are homeless, offer discount clothing and food for those in need, organize outlets for social and community engagement, and much more. NPOs provide various opportunities for community involvement, but in recent years the government and other types of donors, have been pressured to evaluate the funding for these groups. Arts organizations have

not been immune to this trend. Recent studies have found that museum funding has decreased at the federal level. Museums also receive funding from various sources, but it does not guarantee a consistent income. This research will analyze recent funding trends for various 501c3 arts NPOs to categorize their sources of funding over a three year period. Analysis will be conducted on the funding trends and potential causes for increases or decreases. Information will be obtained from recent IRS Form 990 filings for arts organization in the Acadiana region of south Louisiana.

Presenter: Dr. Minh Huynh; *Marketing & Supply Chain Management*

Title: ***Experiential Learning Approach to the Development of BizWeek Web App***

Advisor/Secondary Author: Eraj Khatiwada

School: Southeastern Louisiana University

Abstract:

This paper shares our experience in developing a Web App to support the Business Week event at Southeastern Louisiana University. This project is based on a real-world need. The work was guided with the eight principles in an experiential learning activity to ensure the delivery of the App as well as the learning and the experience elements. The paper proceeds with the description of tools used and the process of learning and doing the work. The paper then illustrates how BizWeek Web App works and concludes with the reflection, evaluation, and acknowledgment of the experience.

Session 2, ROOM #2: Magnolia Room

Presenter: Benjamin Boyett, Jordan Perez, Blake McHugh; *Industrial & Engineering Technology*

Title: ***Rapid Setting Cement Based Mortars using Nano Silica***

Advisor/Secondary Author: Mohamed Zeidan

School: Southeastern Louisiana University

Abstract:

The research team is attempting to develop a mortar than can be used for 3D printing or automated brick laying applications. The improved performance of this mortar may be achieved by adding varying amounts of nano silica to the mixtures. The goal of the study is to obtain a mortar that has reduced set time, increased compressive strength while maintain acceptable level of viscosity/rheology. Recent studies obtained indicated that adding nano-silica to cement based mortars or concrete accelerate early crystallization of Calcium Silica Hydrate (CSH) sites, which are primarily responsible for determining mortar compressive strength and setting time. However, previous studies are also showing that nano-silica may impact the flowability and workability of these mortars. To investigate these effects, mortar and paste mixtures were prepared with varying addition rates and particle sizes of nano-silica. Flowability of mortars was evaluated using flow table test. Compressive strength of mortar cube specimens were also determined ad different ages. Moreover, cement pastes with nano-silica was tested to

determine initial and final setting times using Vicat needle apparatus. In effort to improve flow, super plasticizers have been added to some mixtures containing higher rates of nano-silica particles. Compressive strength results for mixtures containing one to five percent nano silica by weight have proven to have higher compressive strengths compared to the control mixture with five percent being the highest average. However, this improvement did not continue for mixture containing higher than five percent silica. This may possibly attributed to the inability to effectively compact the mortar effectively because of low workability. Flow table results indicted decrease in workability with addition of nano-silica. However, the reduced workability was relatively lower for mixture with up to 5% nano silica. Furthermore, addition of nano-silica resulted in reduction of both initial and final setting time of cement pastes.

Session 2, ROOM #3: Shadows Room

Presenter: Kyla Zimmerman; *Psychology*

Title: ***Demons Within: Shared Perspectives between Undergraduates and a Local Mass Shooter***

Advisor/Secondary Author: Dr. Emily K Sandoz, Jonah McManus

School: University of Louisiana at Lafayette

Abstract:

It is difficult for most people to imagine the kinds of ideas would support someone committing horrific violence against strangers. And yet, these crimes occur in the U.S. with a fair degree of regularity, suggesting the sentiments involved may not be all that bizarre. The current study sought to explore how a sample of undergraduates might endorse the ideas of a local mass shooter, and how that endorsement might correlate with measures of psychological well-being and prosocial behavior. Statements were harvested from the personal diary of John Houser. Undergraduates self-reported their agreement with his statements, and completed questionnaire assessments of psychological flexibility, self-compassion, and sexism. A significant number of undergraduates endorsed the diary statements, which tended to fall into two primary factors: criticisms of America, and criticisms of minorities. Patterns of correlations suggested that both factors were associated with psychological flexibility, self-compassion, and sexism in distinct patterns.

Presenter: Patrick Rappold; *Psychology*

Title: ***Perceived Parenting, Psychological Flexibility, and Perspective Taking as Predictors of Altruism***

Advisor/Secondary Author: Dr. Emily Sandoz, Caleb Fogle

School: University of Louisiana at Lafayette

Abstract:

Altruistic behavior has been conceptualized from a variety of perspectives, including immediate and historical contextual factors. Amongst them is the degree to which parents are caring and protective. The flexible connectedness model offers three potential mechanisms by which

parenting may influence altruism: perspective taking, empathic concern, and psychological flexibility. The current study examined perceived parenting style as a predictor of altruism and the flexible connectedness factors as potential mediators of this relationship. The study found that authoritarian parenting positively significantly predicted altruism, and permissive parenting significantly predicted a decrease in altruism. Further, authoritative parenting was found to significantly positively predict perspective taking, and authoritarian parenting significantly negatively predicted psychological flexibility. Neither psychological flexibility nor perspective taking were found to significantly predict altruism, however, making mediation impossible. The current study's results suggest that inflexible parenting (i.e., authoritarian parenting and permissive) may influence how we treat others in unexpected ways, sometimes benefiting society at a cost to the individual.

LUNCH: 11:30 AM – 12:45 PM
Atchafalaya Ballroom

Session 3: 1:00 PM – 2:15PM

Session 3, ROOM #1: Bayou Room

Presenter: Sarah LeJaunie; *Psychology*

Title: ***Effects of Familial Relationships on Rape Myth Acceptance and Feminist Attitudes in College Students***

Advisor/Secondary Author: Dr. Margaret E. Cochran

School: Northwestern State University

Abstract:

Rape myth acceptance and feminist attitudes are linked and can affect behaviors toward victims of sexual assault and women in general. The present study examines the relationship between the type of familial relationship and scores on the Illinois Rape Myth Acceptance Scale, Attitudes Toward Male Rape Scale, and the Social Roles Questionnaire. Men scored significantly higher than women on every measure, showing higher female and male rape myth acceptance and more traditional gender attitudes. Familial relationships (siblings and children) had no significant effect on any of the measures. The findings support the gender gap found by previous research, and the lack of significance of familial relationships may suggest that constant exposure to those of the opposite gender is not enough to alter attitudes about rape myths or feminist attitudes. People may need to be directly educated on these issues to overcome their misinformed and prejudiced attitudes.

Presenter: Jennifer Richard; *Sociology*

Title: ***Trends in Louisiana domestic homicide rates: A qualitative analysis on how love kills***

Advisor/Secondary Author: Tina Granger

School: Nicholls State University

Abstract:

Domestic violence homicide is a societal issue that is on the rise, currently ranking Louisiana second place for states with most domestic violence related crimes. During 2013-2015 there were 256 domestic-violence homicides among the Louisiana 64 parishes. In 2017, East Baton parish reported 106 domestic homicides, thus incurring a 50% increase in one parish over the reported Louisiana three-year domestic homicide rates. Factors related to domestic violence include: dysfunctional family dynamics, substance abuse, mental health, prior history of domestic abuse, and economic issues. A current theory is that firearm divestiture will decrease rates of domestic homicide. In 2013, Lafourche Parish developed a Firearm Divestiture program. Research will review the effects of this program on domestic homicide rates.

Methodology: Louisiana domestic violence homicide data for the years of 2013-2015 were analyzed to determine emerging trends. Data analysis included data cleaning; SPSS v. 21, and cross tabulation of variables. Results: many myths and stereo types associated with perpetrators were proved inaccurate in this study. Current opinion is that your ex-spouse or ex-intimate partner is more likely to kill, but data reveals that the perpetrator is more likely to be a dating partner. Research revealed that 53.91% of domestic homicides were committed with a firearm, 17.9% blunt object and 13.28% were with a knife. Secondary findings indicate an increase in domestic homicides relative to grandchildren murdering grandparents and that East Baton Rouge parish residents are at a higher risk of domestic violence homicides. Research indicates that there was an increase in domestic multiple victim/suicide rates. Implications: social services providers need to provide supportive services to grandparents who are raising grandchildren and to the low socio-economic populations around the Baton Rouge area. Parishes should institute the Firearm Divestiture program with domestic violence resource awareness campaigns.

Presenter: Allison Liberto; *Criminal Justice*

Title: ***Perceptions of Safety on UL's Campus***

Advisor/Secondary Author: Dr. Ami Stearns

School: University of Louisiana at Lafayette

Abstract:

In recent years, the amount of crimes reported to the police on college and university campuses has steadily decreased with a few increases spread throughout the years. As of 2017, only twenty three states allow colleges and universities to make their own decisions regarding firearms, with eight allowing weapons on campuses, and the remaining states banning them from college and university campuses. A self-report survey was used to find out the perceptions of safety on UL's campus. The findings of this study agree with previous research that weapons are not needed to feel safer.

Session 3, ROOM #2: Magnolia Room

Presenter: Julia Daigle, *Biology*

Title: ***Assessing Efficacy of Stop the Bleed Education***

Advisor/Secondary Author: Dr. Bruce Felgenhauer, Dr. Christy Lenahan, Dr. Bridget Price

School: University of Louisiana at Lafayette

Abstract:

Stop the Bleed is a national grassroots, education campaign effort that focuses on empowering the public to recognize and control life-threatening bleeding emergencies. The White House, Homeland Security, and the American College of Surgeons - Committee on Trauma, and the Hartford Consensus have endorsed the program since 2015. Stop the Bleed is a call to action plan to train the public on hemorrhage recognition and control until medical personnel are available for management. An additional initiative is to place bleeding control kits in every public place. This project will focus on educating 80-100 professionally trained and lay persons utilizing handouts and presentation information provided by the Stop the Bleed campaign. The education process involves the use of material focused on hemorrhage recognition while the second component of training involves active and return demonstration of tourniquet use, wound packing with gauze, and hemostatic agents for major bleeding control. A retrospective study evaluating pre and post questionnaires will be utilized to assess knowledge of bleeding control education. The goal of this project is to prove that the Stop the Bleed campaign initiative can effectively train individuals regardless of current knowledge level. The significance of this study is to prove efficacy and support training of the public in responding to natural and unintentional disasters that result in uncontrolled bleeding.

Key Words: hemorrhaging, stop the bleed, bleeding control

Presenter: Gabrielle Gautreaux, *Pre-Medicine*

Title: ***Assessing poison records of an historic Louisiana pharmacy 1909-1920***

Advisor/Secondary Authors: Dr. John Doucet

School: Nicholls State University

Abstract:

The J.J. Ayo Pharmacy was an historical business that served the communities of Bowie and Raceland in Lafourche Parish in the first half of the 20th century. The Archives and Special Collections of Nicholls State University collected over 16-linear feet archival materials from the pharmacy produced over the course of its operation (1899-1957). We conducted a descriptive and exploratory study of the pharmacy's Poison Records Book, a ledger that documented sale of contemporaneous poisonous chemicals over the course of 11 years, beginning in 1909. The book provides information on name of drug, intended use, date sold, and quantity sold, as well as customer name and occupation. Over 800 entries of information from the book were transcribed into a spreadsheet and sorted for analysis. Chemicals and their spectrum of uses were inferred from the explicit intentions recorded as well as from historical and modern

chemical references. Some chemicals included phenolics, binary acids, strychnine, and iodine compounds. Common applications of these poisons were disinfection, medical treatment of animals, and elimination of wild nuisance animals. Interestingly, some of the historical poisons listed are widely available in modern formulations. Legal reasons for maintaining such a ledger book distinct from other pharmacy operations coincide with establishment of historical predecessors of today's FDA. Such forensic analysis of dispensed poisons provides historical perspectives not only on the Lafourche wetlands communities, environment, and culture over the early decades of the twentieth century but also the evolution of poison chemicals and their characterization over the course of time.

Session 3, ROOM #3: Shadows Room

Presenter: Brennon Dardar; *Geomatics*

Title: ***Enhancing capabilities for monitoring coastal levees with small unmanned aerial systems***

Advisor/Secondary Author: Dr. Balaji Ramachandran, Dr. Gary LaFleur, Jr.

School: Nicholls State University

Abstract:

We are presenting preliminary results on a levee monitoring study where we deployed small unmanned aerial systems (sUAS). Our model study area contains a 5-mile stretch of the Morganza to the Gulf Hurricane Protection System designated "F Reach". This comprehensive protective levee contains a total of 72 miles of earthen levee with 12 flood gates proposed to be constructed within navigable waterways. Our primary objective was to evaluate the effectiveness of sUAS for evaluating structural stability, crown elevations, and vegetative cover. We deployed a fixed wing rover (Trimble) with 40 minute flight endurance that was operable in wind gusts up to 40 mph. The payload included a digital camera with RGB, near infrared, and multispectral sensors set at varying degrees of resolution. Pre-programmed flights were conducted under the supervision of a licensed pilot with an observer using line-of-sight monitoring of the aircraft at all times. The raw image data was processed to obtain a high-resolution orthomosaic (2 cm / pixel), a photo-derived dense point cloud, and a 10 cm digital surface model (DSM). The high resolution DSM was valuable in assessing the structural stability of the levee, including the ability to resolve areas where slight gravel erosion was occurring. Future research efforts will include utilization of multicopter air-frames, Lidar, and hyperspectral sensors for modeling the lock and flood gate structures, enhancing the accuracy of the DSM, and automated extraction of vegetative cover. In parallel, we are also using this technology to monitor barrier island restoration and ecological integration of a range of coastal habitats. This research was supported by Terrebonne Levee and Conservation District, and Navigation Electronics Inc.

Presenter: Anna Kovalenko; *Computer Science*

Title: ***Robust Resource Allocation Using Edge Computing for Smart Oil Fields***

Advisor/Secondary Author: Mohsen Amini Salehi, Razin Farhan Hussain, Omid Semiari, Saeed Salehi

School: University of Louisiana at Lafayette

Abstract:

Efficient and safe petroleum extraction in remote and offshore oil fields is a challenging and hazardous operation. To address this challenge smart oil fields have been proposed and deployed for remote offshore oil fields. An smart oil field includes a wide range of sensors (e.g., for gas density, pipeline pressure, and temperature sensors) that collectively generate one to two terabytes of data per day. Most of the data needs to be analyzed in real-time for safety and decision-making purposes. Existing smart oil field solutions operate based on satellites communication and distant (onshore) cloud servers which are not feasible due to a significant transfer time delay. In this paper, we investigate the use of edge computing to obviate the challenges of such remote oil fields. We propose a robust resource allocation model which is aware of the connectivity, limited computational capacity, and resource intensiveness of applications in the oil fields. To achieve robustness, we develop a resource allocation model that efficiently allocates tasks to appropriate edge or cloud resource to satisfy the real-time constraint of applications. Evaluation results show that proposed model can significantly improve the performance of the system in compare to conventional cloud-based architectures. Hence, making oil and gas industry safer for workers and the environment.