



2016
College of Arts and Sciences
Undergraduate Symposium



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Auburn University at Montgomery
College of Arts and Sciences
Undergraduate Symposium

April 1, 2016

Presented by:
The Auburn University at Montgomery College of Arts and Sciences

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The Auburn Montgomery College of Arts and Sciences

Presents

The 2016 Undergraduate Research Symposium

On behalf of the faculty, staff and students of the College of Arts and Sciences, I'd like to welcome you to the annual Undergraduate Research Symposium. Undergraduate research allows our students the opportunity to make their own contributions to a better understanding of the world by engaging in the processes of forming hypotheses, designing experiments, analyzing data, and presenting their findings. Research is a difficult but rewarding enterprise, and the projects presented here represent a significant commitment of time and energy on the part of both the students and their faculty mentors. I applaud their dedication, and invite all of you to enjoy these results of their efforts.

Michael Burger
Dean of the College of Arts and Sciences

Undergraduate Research Committee

Chelsea Ward – Biology
John Hutchison – Chemistry
Silvia Giagnoni – Communication and Theatre
Darren Harris-Fain – English and Philosophy
Mark Benson – Fine Arts
Timothy Henderson – History & World Languages & Cultures
Jerome Goddard II – Mathematics and Computer Science
Bridgette Harper – Psychology

Schedule of Events

| | |
|---------------------|--|
| 8:30 am – 8:45 am | Registration (coffee and snacks provided) 10 th Floor Library Tower East |
| 8:45 am – 9:00 am | Opening Remarks 10 th Floor Library Tower West |
| 9:00 am – 10:00 am | Poster Session I 10 th Floor Library Tower East |
| 10:00 am – 11:30 am | Oral Presentations 10 th Floor Library Tower West |
| 11:30 am – 12:30 pm | Poster Session II 10 th Floor Library Tower East |
| 12:30 pm – 1:00 pm | Lunch (provided) 10 th Floor Library Tower East |
| 1:00 pm | Awards Ceremony and Closing Remarks 10 th Floor Library Tower East |

Poster Session I

1. Evaluation of Lake Martin water samples and treated water for indicator bacteria

Shani Brasher and Hakan Sahinoglu

Mentor: Benedict Okeke

Department: Biology

2. The effects of false feedback on recognition memory and confidence

Crystie Deuter, Joy Johnson,
and Robert Lackey

Mentor: Rolando Carol

Department: Psychology

3. Reality television dating programs exposure and consumption

Sydney Kelsey

Mentor: Rolando Carol

Department: Psychology

4. Senioritis: The struggle is real

Bobby Poitevint

Mentor: Silvia Giagnoni

Department: Communication and Theatre

5. The physiological effects of *Triadica sebifera* on *Rhinella marina*

Brittney Rawls, Jonothan Segars,
Gayle Smith, and Christopher Swann

Mentor: Chelsea Ward

Department: Biology

6. My everyday hero

Matthew Robinson

Mentor: Silvia Giagnoni

Department: Communication and Theatre

7. Mosquitofish response to alarm substance release

Dylan Rogers

Mentor: John Aho

Department: Biology

8. Bio-diesel production

Jacob Hall, Jacob Hyder, and
Mackenzie Harris

Mentor: Yi Wang

Department: Mathematics & Computer Science

Oral Presentations

| | | |
|-----------------|--|---|
| 10:00 am | Modeling habitat fragmentation at the landscape level via reaction diffusion equations | |
| | Alyssa Barnett and Dexter Harrell | Mentor: Jerome Goddard II Department: Mathematics & Computer Science |
| 10:20 am | 3D fluid modeling using a consumer depth/color camera | |
| | Jacob Hyder | Mentor: Luis Cueva-Parra Department: Mathematics & Computer Science |
| 10:40 am | On the exponents of prime factorization | |
| | Safa Motallebi | Mentor: Luis Cueva-Parra Department: Mathematics & Computer Science |
| 11:00 am | Accumulation of proNGF leads to neurodegeneration in Alzheimer's disease | |
| | Sanmeet Suchdeva and Jake Sustarich | Mentor: Geetha Thangiah Department: Chemistry |

Poster Session II

1. An empirical explanation of longitudinal performance profiles of firms

Kasem Abdullah

Mentors: Ravi Chinta and TeWhan Hahn
Department: Business Administration

2. Biomass conversion to bioethanol by simultaneous saccharification and fermentation

Nyeshia Daniels, Christiane Ingram,
and Yoonsoo Yeo

Mentor: Benedict Okeke
Department: Biology

3. A description of metacognitive awareness and working memory in college freshman attending AUM

Wala Hijaz

Mentor: Clarissa Arms-Chavez
Department: Psychology

4. One-percenters on trial: The effect of defendant's ascribed social status on mock juror decisions

Robert Lackey

Mentor: Rolando Carol
Department: Psychology

5. Prodigiosin pigment of *Serratia marcescens* bacteria controls energy and biomass production

Mallory O'Connor

Mentor: Pryce L. Haddix
Department: Biology

6. Second thoughts about the Second Amendment

Tiffany Pattillo

Mentor: Silvia Giagnoni
Department: Communication and Theatre

7. *spes*, please: A screen for new *spermatogenesis defective* mutants in the nematode *C. elegans*

Gayle Smith

Mentor: Tim L. Kroft
Department: Biology

8. Selection and molecular characterization of antibiotic producing microbial isolates from soil

Hakan Sahinoglu & Patrick
Thomase

Mentor: Benedict Okeke
Department: Biology

Abstracts

An empirical explanation of longitudinal performance profiles of firms

Lead Presenter: Kasem Abdullah

Other Authors/Presenters: None

Mentors: Ravi Chinta and TeWhan Hahn

Department: Business Administration

Our study is an offshoot from the confluence of two streams of scholarship: (i) research that empirically debunks high-performance profiling of firms (impermanence of performance archetypes), and (ii) research that addresses the productivity dilemma resulting from the multi-dimensional nature of organizational innovation (tradeoffs between exploratory and exploitative innovations). Following Niendorf and Beck (2008) recommendations, we present empirical evidence, based on data from COM PUST AT firms from 2005 to 2015, on the impact of exploratory innovation and exploitative innovation on the organizational performance profiles. Our data analytical approach examines the residuals in organizational performance remaining after several other influencing variables' effects are eliminated. The variance in the remaining residuals are then analyzed to test the significance of exploratory and exploitative innovations and their interactions in regression models. Our findings reveal that significant resource allocation differences exist across firms that show different performance profiles over time. Our paper concludes with discussion, limitations and implications of our findings.

Modeling habitat fragmentation at the landscape level via reaction diffusion equations

Lead Presenters: Alyssa Barnett and Dexter Harrell

Other Authors/Presenters: None

Mentor: Jerome Goddard II

Department: Mathematics and Computer Science

Habitat fragmentation affects a population in two key aspects, namely, the size of fragmented patches of habitat and inferior habitat surrounding the patches, called the matrix. Ecologists have confirmed that an organism's survival in a system is often linked to the size of the patches, quality of its surrounding matrix, and distance between patches. In this talk, we will model the effects of habitat fragmentation at the landscape level using a reaction diffusion system. We will explore dynamics of the model via study of the model's positive steady state solutions. Our results are obtained through the quadrature method and Mathematica computations. We will briefly explore their biological implications.

Evaluation of Lake Martin water samples and treated water for indicator bacteria

Lead Presenters: Shani Brasher and Hakan Sahinoglu

Other Authors/Presenters: Nyeshia Daniels, Christiane Ingram, and
Patrick Thomase

Mentor: Benedict Okeke

Department: Biology

Sewage and animal waste contamination of bodies of water is a continuous problem, particularly for recreational areas of lakes and rivers. Viruses, parasites, and harmful bacteria are pathogenic organisms that can leave the body through feces. The introduction of large amounts of these organisms into water bodies utilized by humans and other animals can lead to infections and illnesses. Therefore, it is necessary to regularly test these bodies of water for fecal contamination. Coliform bacteria, especially *Escherichia coli*, are used as indicator organisms because they are present in large amounts in human and animal feces and are expelled along with potentially pathogenic organisms. This study was conducted to determine the extent of potential fecal contamination of a portion of Lake Martin in Jackson's Gap, Alabama. Three water samples were taken in duplicates from the following locations: near an intake pipe of the drinking water treatment plant, a random sample, and a treated water sample from a domestic tap. Each sample was evaluated for the presence of coliforms and *E. coli* using the Colilert test kit and IDEXX quanti-trays. Coliforms and *E. coli* were found in all raw water samples, and none was found in tap water samples. Representative *E. coli* isolates will be identified using 16S rRNA gene sequence analysis.

Biomass conversion to bioethanol by simultaneous saccharification and fermentation

Lead Presenters: Nyeshia Daniels, Christiane Ingram, and Yoonsoo Yeo

Other Authors/Presenters: Patrick Thomase

Mentor: Benedict Okeke

Department: Biology

Fossil fuel is non-renewable and a major cause of atmospheric pollution. Moreover, crude oil reserve is decreasing, and demand is increasing due to rapid industrialization. These factors have introduced renewed world-wide interest in the development of biofuel. The first process in conversion of plant materials to bioethanol is saccharification involving the enzymatic conversion of biopolymers into simple fermentable sugars, and the second process is fermentation of sugars to bioethanol. The natural cellulolytic and xylanolytic fungal isolate, *Trichoderma* sp. SG2 (PTA-120389) is a strong producer of β -glucosidase and is a candidate organism for simultaneous saccharification and fermentation (SSF) of biomass to ethanol. This study explored SSF of biomass to ethanol using cell-free enzymes and whole-broth enzymes for biomass saccharification and fermentation to bioethanol. Furthermore, stability of biomass hydrolyzing enzymes of *Trichoderma* SG2 at different temperatures for SSF was examined. In whole broth SSF of switchgrass and waste paper powder the highest ethanol yield was observed with 5% shredded waste paper followed by 10% switchgrass. Results indicate that whole broth SSF compared with cell free enzyme SSF using *Trichoderma* SG2 enzyme is potentially a more cost-effective approach for converting biomass to bioethanol.

The effects of false feedback on recognition memory and confidence

Lead Presenters: Crystie Deuter, Joy Johnson, and Robert Lackey

Other Authors/Presenters: None

Mentor: Rolando Carol

Department: Psychology

Despite common belief, confidence is not always a perfect predictor of memory. In fact, confidence is often a poor predictor of memory accuracy and is also quite malleable. The present study examines the effect of false feedback on recognition memory and confidence. Participants completed two recognition memory tests and received randomized false feedback about their performance after the first test. Participants rated their confidence twice (once after the first test and false feedback, and again after the second). I hypothesized that participants receiving negative feedback would report lower confidence on the second assessment than those receiving positive feedback. I also predicted that participants receiving negative feedback would be more likely to choose the “I don’t know” option on the second recognition memory test than participants receiving positive feedback or no feedback. Findings are discussed in relation to eyewitness memory contexts.

A description of metacognitive awareness and working memory in college freshman attending AUM

Lead Presenter: Wala Hijaz

Other Authors/Presenters: Dr. Beziat, Joy Johnson, and Erica Van Overloop

Mentor: Clarissa Arms-Chavez

Department: Psychology

Metacognition is one's awareness of his or her own thinking. The current study will explore metacognition and working memory in college freshmen who attend Auburn University at Montgomery (AUM). This project will assess the participants' metacognitive and working memory abilities with a series of surveys and with the use of certain metacognitive measures, including the Knowledge Monitoring Assessment (KMA), Working Memory (WM), and the Metacognitive Awareness Inventory (MAI). By determining where college freshmen stand in their metacognitive and working memory abilities, future research in metacognition and working memory could unearth better predictors of academic achievement and improve students' outcomes in these areas.

3D fluid modeling using a consumer depth/color camera

Lead Presenter: Jacob Hyder

Other Authors/Presenters: None

Mentor: Luis Cueva-Parra

Department: Mathematics and Computer Science

This Presentation will be demonstrating the ability of the Microsoft Kinect Gaming Utility to model a fluid. In conjunction with open-source drivers and software, the data gathered from the dynamic fluid can be plotted into a Computational Fluid Dynamic modeling software, this project is solely for the hardware component side of fluid modeling, but at a much lower cost.

Reality television dating programs exposure and consumption

Lead Presenter: Sydney Kelsey

Other Authors/Presenters: None

Mentor: Rolando Carol

Department: Psychology

Navigating through the “Dating World” can be tricky. Our dating strategies and beliefs can be influenced in many ways, both cultural and otherwise. For instance, what may lead some people to focus on their appearance when trying to attract mates? Also, why might some individuals “fight” for their romantic partners more than others?? I explored the potential relationship between reality dating television show exposure and dating practices, beliefs, and expectations among a sample of AUM college students. I assessed whether reality dating show viewing habits was related to viewers’ reported dating behaviors and expectations. Participants completed a brief survey evaluating their reality television viewing habits, with a particular focus on the dating subtype, while also assessing dating practices, opinions on gender roles, and what they may have learned about dating in general from reality dating programs. Correlations among variables of interest will be discussed in light of television’s role in people’s romantic expectations.

One-percenters on trial: The effect of defendant's ascribed social status on mock juror decisions

Lead Presenter: Robert Lackey

Other Authors/Presenters: Brittany Cox

Mentor: Rolando Carol

Department: Psychology

The present study examined the relation between a defendant's ascribed social status (defined as wealth resulting from birth) and jurors' verdicts and opinions of said defendant. The present study implemented a 2(ascribed status: wealthy vs. poor) X 3(crime type: child sexual assault vs. robbery vs. negligent homicide) between-participants experimental design. Findings indicated that crime type was a significant predictor of guilty verdicts and jurors' opinions, while ascribed social status was not. The defendant charged with child sexual abuse was found guilty most often and was judged most harshly, regardless of social status.

On the exponents of prime factorization

Lead Presenter: Safa Motallebi

Other Authors/Presenters: None

Mentor: Luis Cueva-Parra

Department: Mathematics and Computer Science

Since the patterns of the exponents in prime factorization of numbers has not been studied in depth, we have examined these patterns in even numbers for their first prime factor. We will present a formula which generates a sequence of the exponents of the first factor in the prime factorization of even numbers as well as the product of two consecutive even numbers. Eventually, we could use a similar approach to study the behavior of the exponents of other factors, odd numbers and factorials. The results could be used to solve a variety of problems in number theory.

Prodigiosin pigment of *Serratia marcescens* bacteria controls energy and biomass production

Lead Presenter: Mallory O'Connor

Other Authors/Presenters: None

Mentor: Pryce L. Haddix

Department: Biology

Serratia marcescens is a gram-negative, rod-shaped bacterium with facultatively anaerobic metabolism. Under aerobic conditions, *S. marcescens* produces a red, hydrophobic pigment called prodigiosin. The pigment is membrane-bound and known to have antibiotic activity against a variety of cells and organisms. However, little is known about prodigiosin's biological function in the producing cell. Our experiments utilized a continuous culture chemostat to modulate *Serratia* population growth rates between ten and ninety percent of the maximum permitted by an energy-rich medium at 26°C. To determine the effect of pigment on growing bacteria, the ATP contents and yields of pigmented and non-pigmented cells were compared. Consistent with our earlier studies supporting a negative role for prodigiosin in ATP production, we found that non-pigmented cells exhibited higher cellular ATP concentrations across all growth rates. On the other hand, pigmented cells grew to higher yields, particularly at growth rates exceeding 50% of the maximum. Finally, cellular pigment levels correlated with cell yield in chemostat culture, further suggesting a positive role for the pigment in cell production. Considered together, these results reveal a multi-faceted role for prodigiosin in the modulation of *S. marcescens* ATP and biomass production.

Second thoughts about the Second Amendment

Lead Presenter: Tiffany Pattillo

Other Authors/Presenters: None

Mentor: Silvia Giagnoni

Department: Communication and Theatre

During the first meetings of COMM 3743: Advanced Media Writing-Feature Writing, class sessions centered on defining the distinguishing characteristics of feature writing. As journalism students, we primarily focus on a more direct writing style that emphasizes accuracy, brevity and clarity and a writing structure known as the inverted pyramid. With features, a writer has more flexibility while making narrative and creative choices, striving to develop characters within a story while sticking to the facts. Subject matter within the scope of feature writing is also more liberal than hard news; although the subject must be relevant to the given audience, the topics of feature stories range widely. When deciding the focus of my final writing assignment for the class, I chose a deeply personal, topically relevant subject: gun violence. News stories about acts of gun violence on small and large scales are a daily reality in the United States. Shootings on school campuses and in movie theatres make up far too many of our media headlines. I am a gun owner and enjoy shooting for sport. However, in 2015, I became witness to the effects of gun violence when the father of my lifelong friends was shot dead. The narrative of my feature details this event that has forever changed my friends' lives, stresses my shifting attitude about guns, emphasizes the widespread national instances of gun violence and explicates Alabama's existing gun policies. My feature story is an attempt to underscore the necessity of recognition of the gun violence epidemic in this country in order to find a feasible solution. My poster presentation will be in conjunction with the work of two other students from this class.

Senioritis: The struggle is real

Lead Presenter: Bobby Poitevint

Other Authors/Presenters: None

Mentor: Silvia Giagnoni

Department: Communication and Theatre

The topic of this article is to describe with examples of visual context, my experience as a senior in college while finishing my last semester in school. I present an understanding of life as a college student with a comical spin on real life situations and circumstances. My research for this article came primarily from observations of myself. Noticing my every action and procrastinations to determine their motivations and then document them. Other research came from observing my classmates and how they react to the symptoms of "Senioritis." The tone and mindset for this article was inspired by the works of David Foster Wallace. He provides such dry and sarcastic humor to his work that inspired my tone for this piece. The key impact for this article is humor and to provide a point of relation between my reader and myself and their experiences as a senior in college. I will present this article as a poster presentation along with my fellow peers Tiffany Pattillo and Matthew Robinson's articles.

The physiological effects of *Triadica sebifera* on *Rhinella marina*

Lead Presenters: Brittney Rawls, Jonothan Segars, Gayle Smith, and
Christoper Swann

Other Authors/Presenters: Amanda Strozic

Mentor: Chelsea Ward

Department: Biology

Triadica sebifera, commonly referred to as the Chinese Tallow tree, is a native tree species to Southeast Asia that is invasive to much of the Southeastern part of the United States. Field observations have been made that where there is a large density of *Triadica sebifera* there is a low density of amphibians. Previous studies have shown that Chinese Tallow tree leaf litter does have a negative effect on amphibian larvae growth and survival. However, to our knowledge no studies have been performed to understand the physiological effects of Chinese Tallow trees on adult amphibians. In order to understand this relationship our group designed an experiment that looks at the immunologic effect Chinese Tallow trees have on adult *Rhinella marina* (Cane toad, n=30). Our study utilized three different water types (water from a Chinese Tallow infiltrated pond, water from a pond without Chinese Tallows, and then normal tap water). Toads were divided into 3 experimental groups (n=10/group) and each group was given free access to one of the 3 water sources. Blood samples were collected weekly for 9 weeks and tested for phagocytic activity, novel antibody titer, and white blood cell counts. Exposure continued and at 20 weeks of exposure the toads were tested again weekly, for four weeks to measure chronic exposure.

My everyday hero

Lead Presenter: Matthew Robinson

Other Authors/Presenters: None

Mentor: Silvia Giagnoni

Department: Communication and Theatre

This presentation will highlight an article from AUM's student newspaper, the *AUMNIBUS*. The article was chosen to represent the journalistic research and quality that all articles from the *AUMNIBUS* exhibit. The poster will highlight the research process as well as the selection process for the topic.

Mosquitofish response to alarm substance release

Lead Presenter: Dylan Rogers

Other Authors/Presenters: None

Mentor: John Aho

Department: Biology

The mosquitofish (*Gambusia holbrooki*) is a common species found across the southeastern part of the United States. It is an important prey species for many organisms ranging from aquatic arthropods to wading birds. Many studies have now shown that alarm substances released from predated fish play an important role in alerting conspecifics to threats in an area. Our goal was to use extract from freshly dead mosquitofish in minnow traps to see if avoidance behavior will be exhibited around the traps and if the fish's condition affects its response. When trapping was completed we found older fish tended to avoid the extract traps more than younger fish, indicating that age affects their response. In addition the time of year was also found to have an affect with fewer fish caught in the summer sets than in the fall set.

spes, please: A screen for new *spermatogenesis defective* mutants in the nematode *C. elegans*

Lead Presenter: Gayle Smith

Other Authors/Presenters: Won Heo, Emily Robbs, and Kwan Yoon

Mentor: Tim L. Kroft

Department: Biology

In order for fertilization to occur, a sperm and egg must fuse to form a zygote. Understanding more clearly the molecular interactions of fertilization could have beneficial clinical applications both for the treatment of infertility and for the development of new contraceptives. We use the nematode worm *Caenorhabditis elegans* as a model for studying sperm-egg interactions during fertilization. Because it exists as either a male or a hermaphrodite, hermaphrodites can produce self-progeny or, in the presence of males, outcross-progeny. These features provide researchers with a powerful tool for the discovery of new fertilization-defective mutants. A screen was performed to look for new fertilization defective alleles. Hermaphrodite worms were mutagenized with EMS and screened for spermatogenesis defects that render the hermaphrodites self-sterile. These worms were then mated to males that produce wild type sperm, which rescue the sterility defect, allowing production of progeny. This screen produced many mutants. Each of the mutants was outcrossed seven times to wild type males to eliminate other mutations present in the genome. Fifteen *spermatogenesis defective (spe)* mutants survived seven rounds of outcrossing and re-selection for the sterility defect. During the outcrossing process, we determined that many of these mutants were temperature sensitive, showing the sterility defect at 25° C, but not at 16° C. We have begun preliminary mapping for several of these mutants, determining on which of the six *C. elegans* chromosomes they lie. Our ultimate goal is to define new genes that are required for fertilization. Any gene that, when mutated, results in a sterile phenotype is, by definition, required for fertilization in wild type nematodes. Many of these genes will have homologs in other species, suggesting that they also function in the same process.

Selection and molecular characterization of antibiotic producing microbial isolates from soil

Lead Presenter: Hakan Sahinoglu and Patrick Thomase

Other Authors/Presenters: Shani Brasher, Nyeshia Daniels, and
Christiane Ingram

Mentor: Benedict Okeke

Department: Biology

The development of antibiotic resistance by pathogenic microorganisms necessitated the search for new antibiotic substances. For example, strains of *Staphylococcus* are responsible for a range of infectious diseases, and treatment of *Staphylococcus* infections is becoming increasingly difficult due to high rates of development of antibiotic resistant strains. Reasons that account for antibiotic resistance by microorganisms include genes for enzymes that inactivate antibiotics, ejection of the antibiotic by plasma membrane proteins, and mutations affecting mode of action of the antibiotic. This research attempts to isolate from soil a potent natural antibiotic substance with broad activity. Soil samples were collected from Prattville, AL, North-Montgomery, AL, and around the AUM campus in Montgomery, AL. Three random soil samples were collected from each area and pooled together. Nineteen tentative antibiotic producing isolates were purified by repeated streaking on tryptic soy agar plates. After two screening steps, four isolates, N-1, P-2, P-12, P-13, were selected for further studies. Isolate P13 significantly inhibited *Staphylococcus aureus*, *S. epidermidis*, and *Citrobacter freundii* suggesting broad spectrum antibiotic activity. DNA based techniques are being employed to characterize the selected isolates.

Accumulation of proNGF leads to neurodegeneration in Alzheimer's disease

Lead Presenter: Sanmeet Suchdeva and Jake Sustarich

Other Authors/Presenters: None

Mentor: Geetha Thangiah

Department: Chemistry

Nerve growth factor (NGF) regulates cell survival and differentiation by binding TrkA and p75^{NTR} receptors. ProNGF is the precursor form of NGF, binds to p75^{NTR} and induces cell apoptosis. We have recently shown that the expression of proNGF was significantly increased and NGF level was decreased in Alzheimer's disease (AD) hippocampal samples compared to control. In addition, we also found that the expression of p75^{NTR} is enhanced in AD human hippocampal samples. However, it is not known whether the increased p75^{NTR} expression is due to the accumulation of proNGF. Here, we used PC12 cells stimulated with proNGF and found that the expression of p75^{NTR} was enhanced compared to NGF. The proNGF stimulation also increased the RhoA kinase activity leading to apoptosis. The expression of active RhoA kinase was found to be increased in human AD hippocampus compared to control. These results suggest that overexpression of proNGF in AD enhances activation of RhoA thereby leading to neuronal cell death. Supported by AUM faculty grant-in-aid.

Bio-diesel production

Lead Presenters: Jacob Hall, Jacob Hyder, and
Mackenzie Harris

Other Authors/Presenters: Jessica Eastman and
Steven Hubbard

Mentor: Yi Wang

Department: Mathematics and Computer Science

Bio-Diesel is an alternative, environmentally friendl(ier) fuel for any Diesel power vehicle. The poster is about the production and process of doing so until completion and real world testing of the product. The project originated from the Pre-Engineering course in Fall 2015, as a group we chose to produce large quantities of Bio-Diesel in the Engineering building on campus. The process involved multiple stages of testing different chemical solutions and improvements on processing.



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