ABSTRACTS

Clayton State University

Student Academic Conference

April 28, 2017

ORAL PRESENTATIONS & FILM SCREENINGS

Does the death Penalty deter Murder?

Kimberly Smith-Allen

ADVISOR Reza Kheirandish | *MBA*

When speaking on the topic of the death penalty, to say it is a controversial topic would be mildly stated. According to deathinformation.org, since 1976, the percentage of people in favor or opposed to the death penalty has fluctuated significantly. However, those in favor of the death penalty has maintained dominance throughout the years rather than those who are opposed to it. This study focuses on the theory that states with the death penalty will not deter criminals from committing murder. Therefore, the hypothesis will be as follows:

1. States without the death penalty statue will have lower murder rates than states with the death penalty.

This research will include all 50 states. Each state will be identified as either having the death penalty or not having the death penalty. The period used in this study will range from 2005 to 2015, and the murder rates are per 100,000 population.

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Mass Incarceration & Poverty

Jerome Singleton, Darnell Brown, Abdulkarim Alhazmi, Joshua Ifill

ADVISOR Reza Kheirandish | *Accounting*

Our research project focuses on the connection between poverty and mass incarceration in the US. We also discuss the impact of sentencing reforms on and the financial incentives of mass incarceration. We gathered data from and tested our hypothesis in Louisiana because this state has the highest incarceration rate in the country. We examined the jail incarceration rates in 20 parishes from 2004 to 2013. In this sample, we determined the ten parishes with the lowest per capita income had a much higher on average jail incarceration rate than the ten parishes with the highest per capita income. We also ran a regression analysis to determine if an inverse relationship existed between per capita income (independent variable) and jail incarceration rate (dependent variable). We examined the same 20 parishes from 2009 to 2013. The regression analysis indicated an inverse relationship existed, and the correlation was significant.

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The Relationship Between Unemployment and Crime

Ebony Carter-Moore, Ahkanyala Jordan, Baptiste Duvuad, Shivonne Whiskey

ADVISOR Reza Kheirandish | *MBA*

Previous cases have studied serious property crimes as it is related to unemployment. The literature concerning the relation between unemployment and crime is very wide but it can define two major schools of thought regarding this topic. During a period of unemployment, people will try to keep the same standard of living than they had before when they were employed. While maintaining the same quality of life, this too can cause people to do illegal activities such as robbery, theft, rape, etc. Crime has been directly affected by the unemployment of the communities surrounding them. When the unemployment increases, so does the crime rate.

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Impact of Poverty on HIV Rates

Francine Jackson, Chiquita Barnswell, Angela Arnold

ADVISOR Reza Kheirandish | *Management*

HIV across the United States have advanced in record numbers. The prevalence of HIV and other variables show the impact of the disease in different economic and socioeconomic climates. The research paper encompasses a thorough review of data analysis that has shown the impact of poverty and HIV rates within ethnicity, gender, and age. The information collected will reflect data sets over 5 years based on HIV diagnosis and poverty levels within the United States. This research will focus on participants living in urban communities with incomes below the U.S. poverty level.

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Education's Impact on HIV

Alice Holmes, Richard Craven, Micah Kirby, Dominique West

ADVISOR Reza Kheirandish | *MBA*

Due to the rising epidemic of HIV cases in the United States, this research will focus on finding the correlation between educational attainment and HIV infection rates. The data has been collected from 2008 to 2012 from the top twenty-five states with the highest HIV ratios, and looks at the variables of race, age, and education.Â This topic was chosen because there is no research that attempts to draw a correlation between education attainment (post-secondary) and HIV infection rates.

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How education impacts Inflation and Unemployment

Andrew Chu, Charvaiy Evans, Sahba Ghamsari

ADVISOR Reza Kheirandish | *MBA*

This paper provides literature and quantitative analysis, which explains how education impacts the relationship between inflation and unemployment. The literature part is divided into four main sections. The first section explains the basic relationship between inflation and unemployment. The second section describes the education with unemployment relationship. The third section explains factors that affect inflation. The fourth section explains the role of government in creating jobs in our economy. The quantitative part of the paper gives a hypothesis of our topic and presents our research design, which follows with a regression analysis that rejects the null hypothesis. The paper also informs readers about the sampling errors and then explains how our data can be helpful to decision makers in creating jobs.

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The Impact of International Loans on Underdeveloped Countries

Mohammed Alsaud, Ali Almotairi, Arinze Nwune

ADVISOR Reza Kheirandish | *MBA*

This study focus on the impact of international loans on underdeveloped countries. Though trillions of dollars have been spent over the last few decades by international development organizations (World Bank, International Monetary Fund IMF) in loans, credits, aids, and direct foreign investments â€“ many beneficiaries (underdeveloped countries) are either highly indebted poor countries or at the bottom scale of least developed/ undeveloped countries within the world.

A recent concluded world development goal was the Millennium Development Goals with the major aim and objective to reduce global poverty by 2015. However, with an increasing population and infrastructural deficit in countries within scope of study, majority of its population still live under the poverty lines, with low life expectancy as well as high infant and maternal mortality to mention a few, and the impact of international loans in these undeveloped countries using three key indicators economic, social, and political

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Money can't buy you happiness, but it can facilitate it

John Lindsay, Abdulkarim Al Abdan, Arinze Nwune, Alesha Pinckney, Devin Johnson
ADVISOR Diane Fulton | *MBA*

The world happiness index was first published in 2012. Undenounced to us, Gallup does not actually survey the respondents with questions regarding their mood, but instead asks them to rank their country on six topics, GDP per capita, social support, healthy life expectancy, social freedom, generosity, and absence of corruption.
Although, our full paper contains several different variables, the abbreviated presentation contains just two of our most interesting diminishes as you approach 90 degrees North and South Latitude. findings. The first is a moderately positive relationship between distance from the equator and the countryâ€™s overall level of happiness.
The second most interesting finding is a strong positive relationship between a countryâ€™s happiness index and the countryâ€™s mean education level. We believe this is caused since education can be linked to four primary variables used to calculate the level of happiness.

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Comparing job tenure between millennials and previous generations

Joshua Washington, Abdulrahman Alswaidan, Nahis Albarrak, Stephen Cooper
ADVISOR Reza Kheirandish | *MBA*

The purpose of this research is to study job tenure trends between millennials and previous generations. As companies become more progressive, millennials are attracted to the innovation and opportunity provided by these firms. However, are millennials only attracted to the latest and greatest? Or are millennials demonstrating loyalty and commitment to new appointments. We hope to successfully present data identifying job trends between generations.

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The Trump Hypothesis: Testing the relationship between immigrant population and violent crimes in the United States

Megan Simmons, Sultan Alayyaf, Sener Sen

ADVISOR Reza Kheirandish | *MBA*

ABSTRACT: This research will focus on whether immigrant migration to the United States has a significant relationship on the percentage of violent crimes committed in corresponding cities. Aggregate data from the FBI, Census Bureau and the Bureau of Labor Statistics from the last few decades will be analyzed by use of a linear regression model. Four immigrant classifications are used in this analysis: the overall foreign population, Mexican population, undocumented immigrant population, and undocumented Mexican population. Research results found that for the cities where the immigrant population was high, the relationship to violent crimes committed in those areas were not significant.

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The gender wage gap: It's not just occupational choice

Crystal Cohen, Shakoria Morgan, Samira Velani

ADVISOR Diane Fulton | *MBA*

Women make up approximately 50% of the entire U.S. workforce. Nevertheless, the U.S. Bureau of Labor and Statistics (2016) reports that the median weekly earnings for women working full-time is 81% of male full-time workers. Research examining gender wage disparity has suggested that the difference in wages can primarily be explained by occupational choices of women. However, occupational factors alone only partially account for gender differences in pay across industries. Consequently, this begs the questions: â€œWhat factors other than occupation contribute to the gender wage gap? How might these factors interact? This research study seeks to explore how age, marital status, the presence of children, educational attainment, and region of the country may impact gender wage differences in the United States. Research into this topic is pertinent to policies that attempt to correct gender wage differences to increase the economic well-being of the entire workforce

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Women in S.T.E.M. : Representation and the Gender Wage Gap

Shakoria Morgan, Crystal Cohen

ADVISOR Reza Kheirandish | *MBA*

Careers in the Science, Technology, Engineering and Math (S.T.E.M) fields represent some of the highest median wages and fastest growing careers in the United States. Although women earned over 57% of all bachelorâ€™s degrees in all fields, research conducted by the National Clearinghouse Research Center (2014),revealed that women only earned 12% of all S.T.E.M. related bachelorâ€™s degree. Additionally, even when employed in the S.T.E.M fields, women still face differences in pay in comparison to their male counterparts. This research seeks to examine factors that contribute to underrepresentation of women in S.T.E.M. fields, as well as factors contributing to differences in earnings between men and women in S.T.E.M. careers. Factors to be examined are race, gender, age, and specific S.T.E.M. fields.

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Fossil Fuel/Clean Energy v. Health Care Costs

Abdulkarim Al Abdan, Moona Afzali, Mohammed Almansour, Patrick Moore

ADVISOR Reza Kheirandish | *MBA*

This paper is to measure the impact of the dependency of fossil fuels on healthcare, and to determine if, as the usage of clean energy increases the cost of healthcare decreases. We are aware that there is a geological cost associated with the usage of fossil fuels, global warming; however, what is the hidden cost of the worldâ€™s dependency on fossil fuels? In our research, we studied the most common fossils fuels: oil, gas, and coal; as well as the most commonly implemented clean energy sources: Solar, Turbine, and Hydraulic. We compared the findings of the usage of these energies (in Gigawatts per hour) to the health expenditures per capita for the respective years. We recorded data from 2004 â€“ 2014. Our findings are indeed there is a correlation in the type of energy predominantly used by each country and the cost of healthcare for that country.

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Impact of Atlanta-Hartsfield Airport and the Economy in Atlanta

Chiquita Barnswell, Megan Simmons, Francine Jackson, Carmen Williams, Kelvin Brunson, Chiquita Barnswell

ADVISOR Diane Fulton | *MBA*

In light of expansions at Hartsfield Airport, the economy in Atlanta has been both positively and negatively impacted as it relates to employment rate, consumer spending, income rate and supply chain growth. This presentation encompasses a thorough review of data through regression analysis that has shown how both independent and dependent variables have affected the Atlanta area over the last 20 years.

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Film Industry's Effect on Georgia Cities

Carmen Williams, Devin Johnson, Kelvin Brunson

ADVISOR Reza Kheirandish | *MBA*

The research in this paper will focus on whether or not growth of the film industry will improve economic factors within Georgia. Data has been collected from 2001 to 2016. The results of the research lead to the conclusion that many economic factors such as crime, unemployment rate, and income in Georgia, more specifically the Atlanta area, were positively affected by the growth of the film industry over the last 15 years. This was demonstrated across several age groups, ethnicities, and industries.

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Toward Metal-Organic Frameworks Containing Nonbenzenoid Isocyanoarenes and Half-Sandwich Iridium(III)-Based Building Blocks

Farrah Bakr

ADVISOR John Meyers | *Chemistry and Physics*

Metal-organic frameworks (MOFs) are compounds composed of metal ions connected to organic ligands (or bridges) to provide a 2D or 3D porous structure. Unfortunately, 2D molecular squares and rectangles are not well studied. A 2D square or rectangle combines metal-based fragments, which serve as the corner pieces, with organic bridges, the edge piece, to create a planar macrocylic structure. The focus of this study is to obtain a better understanding of 2D MOFs as a precursor to 3D MOFs. More specifically, this project examined the ability of the half-sandwich cyclopentadienyl-iridium(III) fragment to act as a corner piece and support multiple bulky 2-isocyano-1,3-diethoxycarbonylazulene (isocyanoazulene) ligands. To accomplish this, three nonbridging isocyanoazulenes were attempted to be successively added to a half-sandwich iridium(III)-based metal fragment. These complexes will serve as models of the corner piece of a 2D and 3D MOF when bridging ligands are used.

Collimator Shift Studies of Stereotactic Breast Cancer Radiotherapy

Saro Zobian, Kathryn Manely

ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

We present a Monte Carlo simulation of the absorbed dose in the GammaPod, a novel device that is used for stereotactic radiotherapy of the breast cancer. The simulation accounts for the total of 36 collimator/Cobalt â€“ 60 radiation source units used in the GammaPod. We randomly shift the positions of these collimator/radiation source units in addition to changing the geometrical shape of the device to study the effects that the small shifts due to mechanical vibrations have on the absorbed dose distribution.

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Developing New Methods for Forensics Analysis of Drugs

Kathryn Manly

ADVISOR Augustine Agyeman | *Chemistry and Physics*

This work aims at developing new methods that can be applicable to forensic analysis of drugs. The aim is to establish simple, fast, and more cost effective methods. The methods under development are Fourier-Transform Infrared (FT-IR) Microscopy and Raman Spectroscopy. FT-IR Microscopy was used to identify the molecular composition of pure compounds and unknown mixtures of solid samples. The Raman spectroscopy is a complementary technique to FT-IR, and hence used to confirm the results obtained from the FT-IR technique. The FT-IR results for the pure known samples analyzed show that this is a viable method. This implies that the results obtained from the unknown samples are accurate. The Raman studies are still undergoing and is showing promising results.

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A Quantitative Study of Fences and Strings

Christin Cifaldi

ADVISOR Christian Barrientos | *Mathematics*

Fences are a type of graph recently introduced by Barrientos and Minion in their study of alpha-graphs. Fences consist
of t copies of the path Pm, where for every 1 <= i < t, k vertices of the ith copy of Pm are connected, by an edge, with the corresponding k vertices of the (i + 1)th copy of Pm. The graph obtained in this way is called a k-link fence. In this study, we consider fences as pure combinatorial objects and analyze them from a quantitative perspective, that is, for any three positive integers m, t, and k, where k <= m, we determine the number f(m; t; k) of non-isomorphic k-link fences obtained from t copies of Pm. In addition, we present a bijection between the set of k-link fences and the set of k(t-1)-element strings which entries are elements of [m] = {1,2,...,m}.

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The Effect of Diet on the Gut Bacteria Found in the Fecal Matter of Blaberus discoidalis

Chinye Obata

ADVISOR Nikki Sawyer | *Biology*

Blaberus discoidalis is a tropical cockroach; as detritivores they feed on decomposing plant and animal matter. In captivity their diet usually consists of a formulated diet supplemented with a variety of fresh fruit and veggies. Its diet has a direct effect on bacteria found in its gut microbiome, but the gut microbial colonization of most insect species hasn't been studied and is unknown. This study investigates what impact the supplemental diet has on the gut bacteria of B. discoidalis. There are 4 groups with each containing 10 B. discoidalis nymphs: no supplemental diet, low-protein, medium-protein and high-protein supplemental diets. We hypothesize that the microorganisms found in the gut and expelled in the fecal matter will differ between the 4 groups.Fecal matter was collected from each group at the beginning of the diet and again at the end of 9 weeks. The bacteria in the fecal matter was isolated through a a series of dilutions and examined for phenotypic differences.

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Soil Properties of Degraded Urban Riparian Zones in the Piedmont

D'Ante Jolly, Jere Boudell

ADVISOR Jere Boudell | *Biology*

Many of our natural streams have been degraded by urbanization. Healthy soils are necessary for plant growth and restoration success. In urban riparian ecosystems, soils are frequently subjected to nutrient enrichment due to runoff and compaction caused by frequent disturbance. We examined soil nitrogen and phosphorus content and soil compaction in 32, 100m2 sites at 3 river reaches: the unrestored Upper Jesterâ€™s Creek, the restored Jesterâ€™s Creek, and the protected Little Falling Creek. Soil nutrients were measured using a Palintest spectrophotometer. We predicted that the urbanized Jesterâ€™s Creek would have higher soil nitrogen and phosphorus content and greater soil compaction than the restored Jesterâ€™s Creek and the protected Little Falling Creek. Understanding patterns of nutrient enrichment and soil compaction in urban riparian ecosystems will improve restoration success of these highly impacted systems.

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Effects of nitrates on invasive species in urbanized riprian ecosystems

Ariel Blanton, Jere Boudell

ADVISOR Jere Boudell | *Biology*

Invasive, non-native species are often destructive to native species. In urban areas, runoff contains nutrients that affect plant growth. We examined the relationship between nitrates and plant growth in the invasive species Lonicera japonica (Japanese honeysuckle) and Hedera helix (English Ivy) within riparian ecosystems. We assessed plant cover and soil nitrogen in 96, 100m2 sites at an urbanized reach of Jesterâ€™s Creek, a restored reach of Jesterâ€™s Creek, and a protected reach of Little Falling Creek. Soil nitrogen content was determined using a spectrophotometer. We predicted Japanese honeysuckle and English Ivy cover would increase as soil nitrogen concentration increased and that this pattern would be strong in the unrestored, urbanized Jesterâ€™s Creek. Understanding the relationship between nitrates and invasive species helps us comprehend the effects of these nutrients on urban riparian ecosystems and ultimately improves restoration efforts.

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Using DNA Barcoding in a Collaborative Project to Identify Unknown Tropical Species

Tiffany Stoeckig, Paul Melvin

ADVISOR Paul Melvin | *Biology*

DNA barcoding is a method used to quickly identify species by sequencing a region of DNA within specific genes. Data from previously sequenced and identified species are stored in a publicly available database, which can be used to compare to and identify future unknown samples. For this study, 15 different plant and insect samples were collected and identified morphologically by students during a study abroad program in San Salvador, Bahamas. DNA from each sample was isolated and brought back to CSU for analysis. After amplifying the target DNA sequence by PCR, the samples were evaluated by agarose gel electrophoresis to confirm successful amplification. The DNA from viable samples was sequenced and uploaded into the barcoding database for comparison to known species, allowing for confirmation of the morphological identification. Novel samples not found in the database were submitted, along with the morphological identification, for contribution to the database. (Continued)....

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Never Long Gone

Tori Sanders

ADVISOR Jonathan Harris | *Visual and Performing Arts*

My short film Never Long Gone has been chosen as a recipient of the UCARE grant. My film is about a young woman whom is dealing with an unexpected trial along with battles within her relationship.

During the pre-production stage of my film, I wrote the script, constructed a shotlist, created storyboards, and more detailed planning for the shoot. Securing a location, scheduling dates and time for the actors and crew, and getting props and needed set material were all challenges, but it all managed to work out in the end. Another one of my battles lied within the storyline. Ideas for plot were constantly changing in my mind.

My class members/crew help make the two planned days of shooting run smoothly overall. I am very grateful to have a team of great artist in my circle.

My film has been picture locked and is currently being color corrected by a post production class. I am looking forward to advancing the status of my film and can't wait to enter into film festivals.

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Behind the Scenes of The Dean

Linda Sayseng

ADVISOR Jonathan Harris | *Visual and Performing Arts*

The Dean is a short film written and directed by Linda Sayseng, senior at Clayton State University. The Dean is a parody to the opening scene of The Godfather. The last day before retirement, The Dean, receives a request from Professor Stewarts for permanent expulsion of a young male student who took advantage of a young female student.
I will discuss every aspect of my short film. I will discuss pre-production, production, and post production. I will also discuss the aesthetics and creative approach taken when developing the film.

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The Suit

Angelina Servin

ADVISOR Jonathan Harris | *Visual and Performing Arts*

I am a UCARE grant recipient that will be presenting my film, The Suit, which is a film about a man's crisis to escape his everyday life. I will be covering the production, post-production, and distribution plans for this film and taking any questions for discussion afterwards.

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The Dog's Are Barking

Rafael Salis

ADVISOR Jonathan Harris | *Visual and Performing Arts*

The Dog's Are Barking is a long short film about a woman who suddenly starts perceiving all men as dogs. After presenting my film (or an excerpt of it) I'll proceed to talk briefly about the process of making the film. Followed by it's symptomatic intentions.

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Drill Director

Jeron Walker

ADVISOR Jonathan Harris | *Visual and Performing Arts*

Drill Director is a short film. It's comedic parody of army basic training. The focus is to simulate what's it like to work under pressure when an apprentice is learning how to work on set in a exaggerated fashion.

Political Party's Support of Initiatives During the Midterm Election of the President's Second Term.

Stephanie Allen, Joshua Meddaugh

ADVISOR Joshua Meddaugh | *Social Sciences*

The loss of House seats of the presidentâ€™s party during midterm elections is one of the rare laws of political science. If the president serves longer than four years, the party evaluations become negative, accounting for the increased loss of the presidentâ€™s party House seats in the midterm of his second term (Abramowitz, Cover, & Norpoth, 1986). Therefore, the midterm becomes a major obstacle to the success of presidentâ€™s party agenda as the president can count on fewer votes to pass the partyâ€™s policies. Understanding that voter turnout is already lower during midterm elections (A. Campbell 1960; J. Campbell 1987), we ask do the parties use the initiative process to increase voter turnout during midterm elections of a president's second term to spur voter turnout to thwart the loss of seats for their party in Congress, subsequently increasing the likelihood of success for the party's agenda.

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Operations of The Joint Terrorism Task Force

Arthur Stephens

ADVISOR Rodger Bates | *Social Sciences*

The war on terrorism has become one of the biggest events that has come from small to serious issues, worldwide. In this war, there have been many types of resources for terror and the terrorists groups to use in order to get stronger. The usage of technology from the internet growing from Internet 2.0 to sending messages to other nations to recruit and spread signals of terror, cybercrime and financial extortion, to forming massive groups, coups and factions like ISIS to overthrow another government for religious or another ideology to that of violence, the war against terrorism has grown with the increase of terrorism overtime. However, there have been many forms of infrastructures established to try to halt the present and future attacks, ranging overseas, airways, domestic and even online. The Transportation Security Administration, the Federal Bureau of Investigations, and the National Counterterrorism Center are examples of counter-terrorism groups that are currently working sepa

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Dream Thief 2.0

Adam Sturchio, Brian Walton, Alex Lundy

ADVISOR Michael Dancs | *Math*

We plan to show off the progress made on the 3D remake of our video game Dream Thief. Dream Thief is a game we made in CSCI 1100(applied computing) when we were freshman. We presented it at last years academic conference. Since that presentation we've been working in the unity engine to create our vision in 3D. We will be presenting a trailer and a small combat demo at the conference along with an explanation of how we've improved the game over the last year. We plan to keep everything pretty light during this presentation, treating it like a game announcement that one would see at E3 or BLIZZCON, and we'll save all of the "nuts and bolts" content for the Q and A session.

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What defines a sport?

Ryan Nash

ADVISOR Christopher Ritter | *English*

I wish to argue the legitimacy of Esports, and what the game DOTA 2 has done to advance the 'sport.'

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"Voicelessness" in Kate Chopin's The Awakening

Takiah Corbett

ADVISOR Gwendolyn Harold | *English*

The restriction that women face in marriage and society is a recurring theme in 19th century American literature and is prevalent in Kate Chopinâ€™s The Awakening. The Awakening features Edna Pontellier who "awakens" in various ways after being restricted for most of her life. Ultimately, Edna becomes a victim of "voicelessness" due to these restrictions because she faces many circumstances in which she is unable to freely express herself. Though this lack of a voice and self-expression leads Edna to commit an atrocious act and eventually leads to her demise, Edna ends up acquiring a voice by the end of the novel. The purpose of this paper is to argue that Edna's implied suicide at the end of The Awakening leads her out of a life of bondage and restrictions and into freedom.

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POSTER PRESENTATIONS

The college world that keeps on evolving

Laura Huerta

ADVISOR Ann Showalter | *Biology*

College has evolved tremendously since Harvard was founded in 1636, and many of these changes and trends have unexpected consequences for college students. Through infographics, I explored three topics related to components of college life. My first infographic illustrates how the tone of indoor lighting affects problem solving abilities, where students have an increase in problem solving abilities when in their preferred lighting. My second infographic shows how global warming has negatively impacted coffee production because of poor growing conditions and lack of water. By 2050, coffee production is expected to decrease by 50%! How are we going to stay awake during finals week? Finally, I explore the effect of electromagnetic frequencies (EMFs) on human health. We are exposed to so many electronics that the many EMFs given off could be very harmful to our health. Overall, lighting, coffee, and electronics indirectly affect us as college students in ways we never expected.

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A Study on the Detection of Staphylococcus aureus Biofilms on Tampons

Amber Hightower

ADVISOR Renee McFarlane | *Biology*

Staphylococcus aureus is a bacteria that can be harmful to the human body. Women can become susceptible to this bacteria via the use of tampons during menstruation. Tampons can be found in many stores, in various sizes and fibers. The packaging of tampons come with many warnings and instructions on the proper use of tampons; however, these instructions or warnings are not always read by users. Improper use of tampons could possibly lead to Staphylococcus aureus forming a cluster of bacteria known as biofilms on the tampons that can lead to fatality among women. Through this research the fibers in tampons such as cotton and rayon, will be examined and the amount of biofilms will be measured on each fiber. With this data it can help females understand the importance knowing potential hazards tampons can cause with improper use.

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Hot- Cold Hemolysis Exhibited by Staphylococcus, Enterococcus, and Streptococcus

Unteuna Luke

ADVISOR Renee McFarlane | *Biology*

Exotoxins, which is produced by gram positive bacteria causes fever, changes in blood pressure, inflammation, and lethal shock. Exotoxins are proteins produced inside pathogenic bacteria, such as Streptococcus agalactiae, Staphylococcus aureus, and Enterococcus faecalis, then secreted or released into the surrounding area. Exotoxins have hemolytic activity which varies depending on the bacterium. The goal for this experiment is to look at the hemolytic behavior of the three different type of bacteria along with observing hemolytic activity of exotoxins enhanced by incubation below 10Ëš C after treatment at 37Ëš C.

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The Effects of Iron on the Biofilm Formation of Pseudomonas aeruginosa

Quanitria Robinson

ADVISOR Renee McFarlane | *Biology*

Pseudomonas aeruginosa is a Gram-negative, free living bacterium that is naturally found in environments such as soil, water, humans, animals, plants, and hospitals. P. aeruginosa thrives and colonize in different conditions such as hospitals forming a cluster of biofilm formation that affects patients with serious diseases such as cystic fibrosis. This microorganism is linked to fatal deaths. Research shows that a decrease in the amount of nutrient dependent iron will result in an increased amount of alginate, therefore leading to an increase in biofilm formation. In this study we will study the physiological effects of varying amounts of iron on the production of biofilm.

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DNA fingerprinting of Terrapene carolina (eastern box turtle) subpopulation with shell disease

Jonathan Patton, JoVonnda Chresfield

ADVISOR Diane Day | *Biology*

Terrapene carolina (eastern box turtle) populations have been experiencing widespread and ongoing declines, estimated to exceed 30% over three generations. The cause of this decline is not certain. A subpopulation of T. carolina has been studied at The Ridge Nature Area in Fayetteville, GA for five years. This subpopulation suffers from an unexpectedly high degree of shell deterioration, called pitting. Previous attempts to pinpoint an environmental cause of this pitting have been unsuccessful. The purpose of this experiment is to test whether there could be a genetic correlation for this shell disease. If a genetic correlation exists, we expect those turtles with more pitting to show higher patterns of relatedness. DNA samples have been collected from the subpopulation, purified, and fingerprinted using four primers on electrophoresis gels.

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Come to your senses: The effect of essential oils on bean beetles

Sierra Manesh, Elise Radcliffe, Jada Headspeth, Diamond Haughton, Keondra Walters

ADVISOR Ann Showalter | *Biology*

Bean beetles (Callosobruchus Macultus) are agricultural pests that destroy bean crops worldwide. Many farmers use pesticides, herbicides, or insecticides to protect their crops. For bean beetles, insecticides are the main form of pest control used on the black eye pea crop against the bean beetles. We examined whether organic essential oils would attract or deter bean beetles from stored cowpea beans. Using lemongrass, lavender, and peppermint oils, we measured the amount of time a bean beetle spends near the oil compared to a control. Bean beetle behavior was recorded on a camcorder and analyzed using Solomon Coder. Statistics were determined using analysis of variance (ANOVA) test. Preliminary results indicate that bean beetles avoid any oil if it is present. Using essential oils as an alternative to pesticides is an innovate and organic method to controlling bean beetle infestations because oils may naturally deter bean beetles away from beans left in storage.

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Bean Beetles 101

Tyler Snow
ADVISOR Barbara Musolf | *Biology*

My presentation will discuss different topics dealing with bean beetles. I will cover topics such as body parts and their functions. The Male and Female sex comparison. My poster will also cover the stages in which a bean beetles goes through before it reaches full adulthood. My research is not only important to the further understanding of bean beetles but my drawings of the beetles help the students in Bio `1108 to understand bean beetles. They help it easier to see the body parts and understand how they work. By seeing my poster presentation it will be a fun yet educational way to learn more about the wonder life of Callosobruchus maculatus (bean beetles).

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Protein Intake and its Effect on Growth in Blaberus discoidalis

Xania Reed
ADVISOR Nikki Sawyer | *Biology*

Our experiment was to determine how protein intake influences the growth rate of Blaberus discoidalis. B. discoidalis, commonly referred to as the tropical cockroach, is a gregarious and foraging cockroach that relies on detritus for its nutrients. To measure the effects of B. discoidalis protein intake on growth rate, we used four groups of nymphs supplemented with vegetables and fruit containing different amounts of protein. All groups had access to a standard roach chow with ~13% protein. Group 1 received a supplement of potato and avocado (~4% protein), Group 2 received a supplement of banana and lettuce (~2%), Group 3 received a supplement of apple and cabbage (~1% protein), and Group 4 received only standard roach chow as a control group. Ten roach nymphs were individually housed and put on these diets for a total of 9 weeks. Our hypothesis is that Group 1 will show the fastest growth rate. To measure growth rate, the roaches are weighed biweekly and the number of molts counted.

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The effect of cadence on muscular activity and performance during the push-up exercise

Travet Witherspoon, Michael Wood, Wade Oglesby

ADVISOR Hae Ryong Chung | *College of Health*

The push-up is a classic exercise that is used to strengthen the upper body. It is popular because it is a body weight exercise which can be modified to accommodate different ability levels. The push-up is also used to assess muscular endurance during fitness testing in school, professional, military and civil service settings. Though several standardized protocols have been established, there are still a variety of execution related issues that can have an effect on test results. Variation in hand placement, range of motion, and speed may have an effect on performance. These issues have not been fully examined to date, which may affect interpretation of testing and training outcomes. PURPOSE: To study the effects of cadence on performance and electromyographic (EMG) activity of the pectoralis major and triceps brachii during a push-up exercise to failure in young and healthy college males.

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Learning Assistants Program

Dana Eap, Rae Adams, Maria Delgadillo, Ashley Orta, David Hernandez, Kathryn Lane

ADVISOR Barbara Musolf | *Biology*

The learning assistants program aims to solve this problem through introducing peers as a â€œmiddlemanâ€ between professors and undergraduate students utilizing the fact students learn from students. By collaborating weekly with instructors to develop pedagogical tools to aid in undergraduate studentâ€™s attainment of concepts covered in Principles of Biology Labs, we have found that this program has significantly increased the studentâ€™s attainment of knowledge through a quantitative analysis of their grades. This program has furthered the learning experience of students through guided questions and bridging the gap in communication.

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Callosobruchus Maculatus Dominant Behaviors

Carina Figueroa, Areli Macias, Oriana Pineda

ADVISOR Barbara Musolf | *Biology*

It has been observed that various animals, including Callobruchus maculatus, display dominant behaviors towards other males when females are present. Prior knowledge informed us that bean beetles tend to act by mounting, chasing, antennating, and boxing to compete for dominance. However, there are limited studies that have been conducted, which is why our goal was to gain insight in the frequency of their reactions to other males when a female is present. We compared virgin and non-virgin sedentary males in groups and calculated aggression scores for each. We examined three different groups of beetles that varied in the numbers of males with one female, and we recorded the frequencies of different aggressive behaviors shown by the males. Based on our study, we were able to observe that when the number of males present is elevated with one female, the malesâ€™ dominant behaviors increase. Our research can help provide new information for future studies based on the C. maculatus' behavior.

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Infographics: Complex Chemistry Made Simple

Maria Delgadillo, Yasmeen Khan, Kelly Nguyen, Joh Meyers

ADVISOR John Meyers | *Chemistry and Physics*

Students were challenged to effectively communicate and promote the underlying chemistry behind every day events to members of the general public. To this end, internship students created informative infographics containing figures and facts that simplified complex chemical topics. In addition to the infographic, a short research paper was written to summarize the technical chemistry. Commonly encountered topics of interest that were covered in infographics include the chemistry behind the production of tequila, digestion in the stomach, and function of air bags.

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Chemical Communication Through Infographics

Sally Le, Thuy Le, Diane Diatta, Rich Singiser

ADVISOR Richard Singiser | *Chemistry and Physics*

Among the many skill sets a scientist must possess, communication is vital and deserves more attention and development. Scientists are able to approach this matter by researching and designing visual representations of interesting scientific topics. The purpose is to incorporate creative ways to communicate scientific literature in an appealing and understandable way for the general audience. Even now, presenting scientific material in an engaging manner is still being met with difficulties. Often, published data can be too technical and difficult to read even to science majors. This is an area of concern as the results of scientific research are increasingly integrated into the modern lifestyle. Through the use of infographics, scientific data can be reflected in an informative yet fun way that could further promote interest in the science field. To learn better communication skills and connect with the general public, several infographics were created.

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Investigations on Cationic and Anionic Structures of Silicon Clusters Doped with Two Gold Atoms

Diane Diatta

ADVISOR Jonathan Lyon | *Chemistry and Physics*

Properties of multiple structures of silicon/gold clusters (Si(n)Au2) were studied using Gaussian 09. For each structure studied, a singly charged cation and anion of that structure were investigated. Initial structures of the clusters of interest were constructed from the neutral counterpart with approximated bond lengths, using GaussView and Spartan programs. Optimization calculations were conducted utilizing the Density Functional Theory BP86 method, aug-cc-pVTZ basis set for silicon atoms, and SDD(2f+g) pseudopotential and basis set for gold atoms. Vibrational frequencies and zero point energies were calculated. Global minimum structures were determined by comparing relative energies for each local minimum for a given cluster size. Early results indicate a large dependence on the global minimum cluster structure with charge state for certain cluster sizes. The structures with spin multiplicity of 2 are found to be lower in energy than the clusters with spin multiplicity of 4.

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Truss Analysis

Chance Morgan, Victoria Chee, Jonathan Dyar, Joshua Sebastian
ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

A space truss is a structure made of slender members to support weight of various loads. As part of our hands on learning experience, we try to build the most efficient truss. We observe the effect of various weight distributions on the truss. We demonstrate the truss in our presentation.

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Statically Indeterminate Structures

Lindsey Ouy, Mildolent Tawiah, Jean Batta, Jordan May, Darrel Edosa
ADVISOR Tatiana Krivosheev | *Chemistry and Physics*

Our project analyzes statically indeterminate structures. Structures are statically indeterminate when there are more unknown reactions then equilibrium equations. We find ways for indeterminate structures to be solved to achieve equilibrium and analyze two indeterminate systems common in statics, which are trusses and system of cables.

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The chemistry of color through infographics

Hoa Nguyen
ADVISOR Richard Singiser | *Chemistry and Physics*

Infographics utilize visual aids to present much information with little time and makes the data shareable to the general public. There are infographics for everything. The three infographics in this poster cover the following topics; one can have a sense of why hydrangea blooms have a variety of colors, how lemons prevent sliced apples from turning brown, and how your favorite activity, tie dyeing, actually happens at the molecular level. More details of each topic are also presented in short articles for curious minds.

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Analysis of Static Friction in Statics Class

Shinxay Munnicha, Tom Nguyen, David Sor, Tommy Nguyen, Michael Chand
ADVISOR Tatiana Krivosheev | *Physics*

The purpose of this project is to determine the coefficient of static friction over varying surfaces of different materials. We achieve it by attaching one weight resting on a platform to a bucket in which weight can be adjusted. Using the equations of equilibrium we can solve for the coefficient of static friction.

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Playing the Trump Card: A Philosophical Explanation of the Donald Trump Phenomena in the 2016 Election

Alexis Shoats, Katie Hobbs, Krysten Long
ADVISOR Joshua Meddaugh | *Social Sciences*

Much of the discussion regarding Donald Trumpâ€™s rise to the 2016 Republican Presidential nominee has focused on the candidatesâ€™ willingness to speak his mind or his unorthodox approach as a self-righteous individual. Although this rhetoric abounds, little scholarly work exists to substantiate these claims, therefore this work seeks to explain the Trump phenomena with the work of three philosophers; Soren Kierkegaard, Friedrich Nietzsche, and Ayn Rand. Specifically, we argue that although Donald Trump demonstrates some characteristics of Nietzsche's ubermensch, or a superior character of the future, or even a Randian objectivist, he is the realization of Kierkegaardâ€™s public, as he is the false idol of the political far right whose imagery is perpetuated by the media. Ultimately, this work seeks to understand the rise of Donald Trump as a candidate, the role of celebrity in national elections, and to revisit the warnings of Soren Kierkegaard in regards to false idolization.

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Visualization and Analysis of Friendships on Facebook with Gephi

Nguyen Kim
ADVISOR Angkul Kongmunvattana | *Information Technology*

Friendships on Facebook are wide spread. Several tools have been developed for collecting data about friendships on social networking sites, but they are typically hard to analyze due to a large number of data points. Visual analysis is a new approach that enables users to grasp the information embedded in the data points quickly and intuitively. In this work, we extracted friendships data from Facebook in GraphML format and used Gephi to produce graphs for visual analysis. We were able to separate friends into multiple groups based on when we met and befriended them and when they have befriended one another.

Random Number Generation with Sine Computation in Intel x86 Assembly

Dmitri Nunes Dias Fernandes

ADVISOR Angkul Kongmunvattana | *Computer Science*

Abstract: Random number generation has become an important subject in a wide variety of disciplines due to its application in various technologies, such as electronic gambling, statistical sampling of data, computer modeling and simulation, data encryption, and cryptanalysis, among several others. The contemporary techniques usually rely on the system clock from the computing device itself to generate a random number. In this work, we explored a different approach based on the computation of Sine function of an incrementing number representing the radians. The implementation was carried out in Intel x86_64 assembly programming language using both integer and floating-points registers as well as the instructions. The results demonstrated that we can generate several thousands of random numbers without repeating patterns.

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The impact of education and income

Terri Fowler

ADVISOR Reza Kheirandish | *Supply Chain Management*

The title of the research is The Impact of Education and Income. This research will determine if having a college degree has any correlation to a higher income. The agenda consist of introduction, literature review, range of data, hypothesis and results. The hypothesis that we will prove is that higher education level leads to higher level of income. The second hypothesis will show that education benefits some more than others. To prove the hypothesis is a linear graph and a regression equation was created and the information was taken for Digest of Education. One primary point to consider when making of success is the ability of individuals to secure suitable employment. The data was taken from the and US Census for the year 1998 to prove the income difference between men and women. Bureau of labor statistic and US Department of Labor. According to the United States Census Bureau Report in 2007, adults with advance

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