



Book of Abstracts

The CUNY Research Scholars Program

Spring 2017

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Emerging Scholars Program (ESP)

Book of Abstracts – Spring 2017

1. 3D Scaffold Fabrication with Photolithography

Cisco Alers

Prof. Ozlem Yasar

In recent years, Tissue Engineering is utilized as an alternative approach for the organ transplantation. Success rate of tissue regeneration influenced by the biomaterials, cell sources, growth factors and scaffold fabrication. Design and precise fabrication of scaffolds are required to support cells to expand and migrate to 3D environment. Common scaffold fabrication techniques use heat, adhesives, molds or light. In this research, “inverse-photolithography” which is a light based fabrication technique was used to generate the scaffolds UV light with the 365nm wavelength was placed up-side down under the solution. Photocurable mixture was exposed to the UV light for 3 minutes to cure the entire scaffold. This preliminary research showcases, the 3D scaffolds with the controlled interior design, can be fabricated with the “inverse-photolithography” technique.

2. Cardiovascular Diseases: Potential Risk Factors for Alzheimer’s Disease

Tatiana Aquino

Prof. Niloufar Haque

Age-related diseases are becoming a major concern today. The most common is Alzheimer’s disease (AD). This is a progressive neuro-degenerative disorder which destroys brain cells, leading to deterioration in memory and cognition (Liu et al. 2013). However, recent studies have now linked cardiovascular disease (CVD), a leading cause of death in the United States with AD (Masoudi et al. 2017). CVD range from hypertension to cholesterol among others. Fortunately, many cardiovascular diseases are known to be modifiable, meaning one can take measures to prevent them (Heart Health and Brain Health 2014). This report considers how having CVD may increase the possibilities of developing AD, and ways that can potentially diminish the risk for AD.

3. A Feasibility Study of an Energy Recovery System

Josue Bautista, Liza Chiu, Runtao Yao

Prof. Masato Nakamura

As the technology for personal electronic devices develops rapidly, the demand for a reliable energy source to power those devices is increasing. Rather than focus on extending the battery life, the Energy & Environmental Simulation Lab Feasibility Study Group (EESL FSG) focused on developing an alternative sustainable solution that will convert the kinetic energy from normal human physical activity to reusable electric energy.

The proposed energy recovery system harvests the induced current of a solenoid device from the simple oscillating motion of a magnetic projectile, and stores the energy for

later use. Successful experiments from the previous term's feasibility study on electromagnetic induction verified Faraday's Law, and confirmed the viability of such a system.

This term's goal was focused on producing a working prototype. The design incorporated an improved magnetic oscillating mechanism, and an electric circuit and battery system to store the harvested energy. Practical application usage of the device was studied for future design improvements, with an emphasis on ergonomic design in daily usage, which has not yet been considered in research on similar devices.

The success in both prototyping and the practical application studies will provide us with concrete data of this device's usage in everyday life, further supporting the feasibility a self-sufficient life rather than an expendable one.

4. State of Health Care in Texas
Christian Bermeo
Prof. Katherine Gregory

This case study is to analyze the health outcomes of Texas and how the state has managed to improve or limit access to health care after rejecting the Medicaid expansion of the Affordable Care Act. Even though Texas has a long way to go with regards to healthcare coverage, it has taken steps in the right direction to assist those in need. The geographical location of the state has caused issues with its uninsured rates and not expanding Medicaid has not helped with the progress of assisting low-income citizens.

5. Arduino System in Rapid Tooling for Product Thermoforming
Oliver Cabrera, Kevin Duong
Prof. Angran Xiao

In this project, the professor and students in Department of Mechanical Engineering Technology will study the feasibility of using 3D printing technologies to build the molds for the thermoforming of customized products with complex geometries, such as dental moldings and orthotic devices. Four students will conduct a set of experiments to evaluate the relationships between the 3D printing parameters and the engineering properties of the printed parts, i.e., strength and permeability. The relationships will be used to guide the design and manufacturing of thermoforming molds.

6. EESL Combustion Chamber Physical Modeling Group
Giovanni Campos, Justin Colon
Prof. Masato Nakamura

As a part of the Physical Modeling Group, we are constructing part of a combustion chamber. A combustion chamber converts organic matter into energy. We responsible for constructing a mount for the motor which will move a metal bar horizontally. The mount was cut out of metal brackets. Tracers will be thrown in with the garbage. They are made of foam and have different sizes, densities, and shapes. Their job will be to track the mixture of organic material. The purpose is to figure out whether the forward acting grate or the reverse acting grate will be better for trash flow for the combustion

chamber. Overall, in the end, we will create a MATLAB simulation chart which will show the mixture of organic material.

7. Character Sums of Satoyuki Tsukano

Fedora Casimir

Prof. Brad Isaacson

The immediate objective of this project is to prove character sum identities conjectured by Satoyuki Tsukano which express certain character sums as linear combinations of generalized Bernoulli numbers. When comparing dimension formulas of Siegel modular forms by the Riemann–Roch theorem and by the trace formula, we often get exponential sums by the first method and the Bernoulli numbers appear in the second method as special values of L-functions. Tsukano has made character sum conjectures involving similar relations. While Tsukano's character sum conjectures are extremely complicated and unfeasible to verify by hand, they are easily verified by computer for odd primes $< 10,000$. We aim to express Tsukano's character sums by finite sums of products of periodic Bernoulli polynomials which obey certain addition formulas. Our hope is to evaluate Tsukano's character sums by repeated application of these addition formulas, thereby proving Tsukano's conjectures.

8. Modeling the Interaction of Multi-Target Compounds with the BACE 1 Enzyme:

Implications in the Treatment of Alzheimer's Disease

Coreen Cooper

Prof. Mai Zahran & Prof. Alberto Martinez

Dementia is a neurodegenerative disease that affects over 48 million people worldwide. Alzheimer's disease (AD) is the most common form of dementia (over 60%) and is the 6th leading cause of death in the United States. Neither cure nor adequate treatment have been discovered yet. One contributing component of AD is the presence of Amyloid Beta ($A\beta$) plaque in the brain. $A\beta$ plaque is caused by the accumulation of $A\beta$ peptides which are the byproduct of Amyloid Precursor Protein (APP). In AD, the enzyme Beta-site APP Cleaving Enzyme (BACE1) irregularly snips APP, which creates $A\beta$ peptides. Targeting the inhibition of BACE1 is a practical strategy for drug design. Four compounds AM29, AM49, AM56 and PEH45 designed experimentally show a potential of inhibiting the function of BACE1 (unpublished data). The goal of this project is to understand the interaction mechanism between each of these compounds and BACE1 in order to gain insight on (i) where the compounds bind to BACE1, (ii) how they are able to inhibit its function, and (iii) how to improve the future design of compounds to successfully inhibit BACE1. A combination of Molecular Docking and Molecular Dynamics methodologies are used to simulate the interaction between the compounds and the BACE1. After selecting the ideal conformations from the docking results, Molecular Dynamics (MD) simulation is being performed, to sample the possible conformations of the complex and observe the molecular interactions.

9. Molecular Characterization of Black Corals (Antipatharians) from the Flower Garden

Banks National Marine Sanctuary (NW Gulf of Mexico)

Craig Dawes

Prof. Mercer Brugler

Black corals (Cnidaria: Anthozoa: Hexacorallia: Antipatharia) are cosmopolitan in the world's oceans and live as deep as 8,900 meters. To date, 7 families, 42 genera and 247 species of black corals have been described. During Summer 2015, LSAMP Scholar Craig Dawes participated in a research cruise aboard the R/V Manta to the Flower Garden Banks National Marine Sanctuary (Gulf of Mexico) to collect mesophotic black corals using the remotely operated vehicle Mohawk. The primary purpose of the cruise was to conduct video and collection-based surveys immediately outside of the sanctuary in hopes of expanding the current boundaries and protecting any newly-discovered communities from further impacts due to oil and gas exploration and drilling. The cruise also surveyed the banks for new, as of yet undescribed species of black corals, and collected additional representatives of the black corals *Acanthopathes thyoidea* and *Elatopathes abietina*. While both species are currently classified in the same family based on morphology, they do not group together in a molecular phylogeny; they are considered wandering taxa as they change positions depending on the gene (mtDNA vs. nuclear) or algorithm (parsimony, likelihood or Bayesian) used to build the phylogeny. To stabilize their position, additional representatives are needed; the cruise successfully collected two additional *Acanthopathes* and six *Elatopathes*. We are amplifying and sequencing three mitochondrial regions (igrN, igrW, igrC) and three nuclear genes (18S, 28S and ITS2) for these two taxa as well as all other black corals collected on the cruise. Based on morphological examination of the black corals collected at sea, we anticipate elucidating several new species based on DNA analysis.

10. Mathematical Approach to Creating 3D-printed Topologies

Marco Dwyer, Allan Morgon, Asli Oney, Mimu Sakuma, Adel Yaseen
Prof. Anne Leonhardt & Prof. Satyanand Singh

Architects and designers typically have an incomplete knowledge of the mathematics behind the 3D computer graphics that are used to create their designs. At the same time, however, an understanding of key concept in topological studies that assists in learning of 3d modeling of forms that are of interest for architecture/design. Beginning from the mathematics software, Wolfram Mathematica, the project sought to create a number of 3D printed studies based on forms commonly studied in topology.

We are going to examine the intrinsic and extrinsic condition of a 2D surface or 3D shape, we then dig deeper/inquire into the nature of certain equations. This project explores topology, often originating from 2D functions, the output is important in the creation of complex 3D models in architecture, including in studies of optimization, as well as their fabrication. Generating complex equations visually was impossible before the evolution computer generated outputs(CAD).

The objective of this research is using topological studies and its metrics to study patterns of closeness and location. Topology is easily accessible to us due to its visual and geometric approach using Wolfram Mathematica. Defining the geometry, using mathematical equations around the Mathematica program, and deploying the functions to create much more complex topological forms and experiment with various 3D printed representations.

Further work in this area may lead to the development of Intermediate 3D mesh modeling and parametrics as well as visualization.

11. Building Packing

Marco Dwyer, Asli Oney, Mimu Sakuma, Adel Yaseen
Prof. Hart Marlow

This research project focuses on the development of new building organization systems through the study of object packing. Object packing is being used as a method to discover new formal and non hierarchical organizations that will later be applied to programmatic distributions. These systems will also seek to propose integrated façade and site conditions as students begin to articulate each packed object. Students will work to research these new systems through a series of physical and digital models.

12. Self-Care Inventory for Psychology Graduate Students and ECPs (SCI-PSY): Scale Construction and Validation

Aspil Estime, Yulduz Saidinova
Prof. Amanda Almond

Maintaining physical and mental health is one of the important roles of self-care. Most often environment surrounding the individual influences self-care caused by negative events. Maintaining the relationship between self-care and stressful environment should be well controlled. The goal of this research is to study how important is self-care for women in Early Career Psychologists (ECPs) and Graduate Students. By examining how self-care influence their lifestyle and how to promote their mental and physical well-being. Also, this research also measures the impact of micro-aggression in work environment for women.

Self-care inventory profoundly affects the lifestyle of ECPs and grad students. There should be always a positive relationship between self-care and flourish the physical and mental health. Also, promotions of their lifestyle and health habits should have a healthy relationship with self-care inventory. Data for this research collected from anonymous surveys that sent to ECPs and grad students in the psychology field. Based on the comment section of the survey, results drawn. Self-care is considered differently amongst women, for example eating healthy or going to the gym. Also, what women do to coop with micro-aggression or negative environment.

13. Characterization of THERM_00194149, a *Tetrahymena Thermophila Sirtuin* Family Member

Edrouine Gabriel
Prof. Ralph Alcendor

Tetrahymena thermophila, a ciliated protozoan, has been a reliable research model for many years. Studies on *T. thermophila* have made significant contributions to biology such as the discovery of ribozymes and telomere function. *T. thermophila* are ideal research models because of the minimum facility required for growth, maintenance and manipulations. Additionally, the complete *T. thermophilagenome* has been sequenced, making it an appropriate model for bioinformatics studies. However, many of the genes found in *T. Thermphilia* like THERM_00194149, my gene of interest, have not been named or annotated completely. The gene, THERM_00194149 is a type of sirtuin which

has been shown to be involved in many activities including the hydrolysis of acetylated lysine on histone and non-histone (tp53) proteins. Sirtuins are also known for regulating transcription through repression 4. They also influence metabolism and lifespan of organisms. Because sirtuins are NAD⁺ dependent proteins, they are involved in slowing down aging 4. Seven mammalian sirtuins (sirt1-sirt7) have been identified 4. *T. thermophila* has more than 18 histone deacetylases (HDACs) of which 14 belong to the sir2 family. The aim of this project is to use bioinformatics tools and cell and molecular biology techniques to characterize and annotate THERM_00194149. The protein sequences of sirtuins from various species were searched using T-Coffee and BLAST. They were aligned and analyzed to determine the THDs or human sirtuins, THERM_00194149 is more closely related to. Knowing which sirtuin gene my gene of interest is similar in sequence and structure to may help in determining the structure and function of it. So far our analysis revealed that THERM_00194149 is most similar to human's sirtuin 2 and *T. thermophila* THD15.

14. Coding Theory

Adam Gronowski

Prof. Satyanand Singh

Coding Theory, which is the study of codes including error detecting and error correcting codes. The study of Coding Theory has become increasingly important over the years with the development of new technologies and data storage. Professor Singh and I studied error detecting codes where it is possible to check for transmission errors made in a code word and it is correctable by not asking for the sender to resend the code word. Generator Matrices are useful because the linear combination of the rows of the Generator Matrix.

On the poster, there will be examples of key elements of coding theory solved as well as two programs written in Python. One program checks the maximum amount of errors and maximum correctable errors in a transmission and the other program solves the amount of errors.

15. Effect of Global Warming on the Rate of Disease in New York State

Tetiana Grygoruk

Prof. Nasreen Haque

Global warming is the increase in the average temperature of the Earth, near-surface air and oceans through greenhouse gases being pumped into the atmosphere from tailpipes and smoke stacks. The concentration of carbon dioxide and other gases has increased worldwide. These trap the heat from the sun. Climate change leads to: Rising temperatures → cardiovascular failure, injuries, mental health impacts; Rising sea levels → water quality impacts, respiratory allergies, asthma; Increasing CO₂ levels → water and food supply impacts, diarrheal disease.

16. PEGDA Sterilization and Drug Delivery Tests for PEGDA based Hydrogels

Kerolos Hanna

Prof. Ozlem Yasar

One of the principle challenges in Tissue Engineering, especially with the production of large tissue constructs, is the cell survivability within the scaffolds. Cells can show healthy growth within the scaffolds if biocompatible materials are used to generate the scaffolds. With the current technologies scaffolds are fabricated using different biomaterials such as PEGDA, PDMS, PLA and PLGA. In this project, mechanical characterizations of biomaterials are studied for Tissue Engineering applications.

17. Town of Mamakating - Master Plan

Taylor Hernandez

Prof. Paul King

Based on my project, there is a large amount of research that is taking place. My project has to do with a building renovation that requires a new addition to the existing building. Lots of research has been done based on what time of framing should be used, what type wood will be used to build the new addition, how much wood will cost at certain lengths, what manufacturers are in that location to make the order and therefore have it brought to the site, and other types of info that is needed.

18. Preparing Tomorrow's Wine Professionals for Continual Growth

Malika Ikramova

Prof. Karen Goodlad

An in depth wine education is important for all hospitality students. This course of study helps students better understand the wine industry but also helps build critical thinking and communication skills. The study of wine and beverage can be challenging; especially due to the lack of prior knowledge some college students have with the subject. The study of wine and beverage demands conscientious attention to detail, academic diligence and a passion for exploring ones' senses. This research will help students be more aware of the value of their wine and beverage.

19. Honors Newsletter Strategic Redesign

Hilda Jara

Prof. Tamrah Cunningham

This research project analyzes the chronological order of editorial magazines and its effect on viewership. This will allow other NYCT students to become involved with Honors Scholars Program at City Tech and a highlight of their events. Using conventions found from researching other forms of magazines, graphic designers will curate a newly designed Honors Scholars Newsletter. To obtain insight on editorial chronological order, the top 5 Magazines will be dissected for their use of grids, imagery and design strategy.

20. Implementing Internet of Things with Open Source Hardware and Software

Ayesha Javed

Prof. Farrukh Zia

Internet of Things (IoT) is the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data. IoT applications can vary from collecting small scale data such as room temperature, to something as big

as collecting personal health information and enabling us to keep track of our personal fitness without having to go to the doctor.

The goal of this research project involves making master and slave node embedded circuits, combined with several different physical and environment sensors, as well as developing program code to make everything work together. The slave nodes send the sensor data to the master node wirelessly and the master node forwards the sensor data to IoT analytics web-site on the Internet that decides an output action. Electrical circuits, computer hardware, software programming and wireless networking knowledge gained from the classroom and laboratory is employed in this research project to develop key components of a small scale Internet of Things framework, by using open source software and low cost open source computer hardware devices.

21. Annotation Tetrahymena – A Model Organism for Molecular Research

Colin Joseph

Prof. Ralph Alcendor

The purpose of this research is to annotate THERM_000672189, one of several Tetrahymena thermophila sirtuins. Sirtuins are a class of genes that function as anti-aging genes in yeast, Caenorhabditis elegans, Drosophila and mammals. These genes are conserved in most organisms and function in other important cellular processes. Thermophila is a unicellular eukaryote that lives in ponds and streams all over the world. These organisms have proven valuable for eukaryotic research. They possess a macronucleus and a micronucleus. Recently, the macronucleus was sequenced; however, all the genes have not been annotated. Gene annotation provides important information on DNA sequences that have not been examined. Through annotation information such as coding and noncoding regions is identified. This project will use bioinformatics and common cell and molecular techniques to gain information on THERM_000672189. The gene information was retrieved from www.ciliate.org. The sequence was compared with other sirtuins T. thermophila and other organisms. Bioinformatics analysis has indicated the coding sequence of this gene involves one exon and it is very similar to mammalian Sirtuin 3. Based on this similarity it is possible that THERM_000672189 may share similar function with mammalian sirt3.

22. Noise Filtering in Big Data

Alisa Kalegina

Prof. Ashwin Satyanarayana

As the usage of big data continues to increase, the demand for extraction of useful patterns from that data does as well. One popular technique used to generate predictions is called ensemble learning; it relies on not simply running one predictive algorithm for a data set, but instead runs several, averaging their results. Our noise filtering technique goes a step beyond, by compiling a second data set that lacks the noisy instances discovered within the original data set via ensemble filtering, and running a suite of predictive algorithms on this resulting set. The technique uses three decision tree algorithms for its filtering process: J48, Random Forest, and Random Tree.

23. Medical Marijuana and Epilepsy

Hebah Kharoufeh

Prof. Niloufar Haque

Epilepsy is a brain disorder in which clusters of neurons, in the brain sometimes signal abnormally causing strange sensations, emotions, and behavior, as well as muscle spasms, and loss in consciousness. The causes of epilepsy vary from illness to brain damage to abnormal brain development, and genetics. According to the latest estimates, about 1.8% of adults aged 18 years or older have had a diagnosis of epilepsy or seizure disorder (2017, cdc.gov). Epilepsy has many different types which are frequently described by their symptoms or by the location from which they originate from in the brain, for example, they are described as temporal lobe epilepsy, parietal lobe epilepsy, etc. Treatment for epilepsy includes medications, surgery, implanted devices, diet, as well as medical marijuana. Cannabis-derived substances, such as medical marijuana, are exogenous cannabinoids undergoing clinical applications and research to determine whether they diminish seizure frequency.

24. File Organization Admin Tool

Volodymyr Komendyak

Prof. Ohbong Kwon

A program that could be used as an admin tool to organize large data sets into designated folders. This program creates folders based on the files extensions that are in the source directory. From there the python code will then copy the files from the parent directory into the newly created folders. The long-term goal is to expand on the code to create a dozen useful functions that could be used in the professional world. A GUI was added to the program for the ease of use and increased accessibility. A log of every run is saved in a separate folder.

25. Peer Led Team Learning Handbook

Victor Lee, Fathima R. Mohamed Rafeek

Prof. Janet Liou-Mark

26. High Fat Diet and its Effect on HPG Axis

Theresa Li, Khosiyatkhon Sayfulloeva

Prof. Sanjoy Chakraborty

High Fat Diet (HFD) concern and its direct correlation into the health became one of the important subjects in the modern societies and how Michael Pollan a food advocate named his book "We Are What We Eat." Hypothalamic pituitary gonadal (HPG) axis works as one whole unique system in the human body and it plays a crucial role in the regulation, reproduction, development and aging. Any alternation in the HPG axis causes many different pathophysiological complication and carcinogenesis conditions. Moreover, many scientific studies showed that eating habit essentially changes physiology function of the HPG axis. To be more specific, HFD causes obesity, high blood cholesterol, dyslipidemia, insulin resistance, glucose intolerance, and cardiovascular disease, some types of cancer disease, poor female reproductive system, non-alcoholic fatty liver diseases (NAFLD), and diabetes and worsens cognitive

function. There is another relative fact that the hormone changes in their organizational and activational level due to HFD is different expressed for male and female. In this research study we focus on its tremendous effect of high fat diet in homeostasis with special emphasis to the reproduction (HPG axis).

27. Roof Farm Study

Oscar Martinez

Prof. Ivan Guzman

New York City is known as the concrete jungle. As a very densely populated city, we face certain adversities that aren't typical to other places. Poor air quality, scarce food sources and overflow sewer systems, among others, are some of the challenges of that the city faces. This is why roof farms have become a viable solution to help alleviate some of these problems. Roof farms use existing roofs as local farms to provide solutions to environment problems. These are the types of challenges that roof farms tackle; they provide solution for urban heat island effect, storm water management, better air quality, and easier access to fresh local food. Although a very interesting concept, Roof Farms do have certain engineering challenges. These challenges include an additional load to a structure that was not previously thought for; excessive storm water runoff due to excessive irrigation; and loss of nutrients due to inadequate roof farm soil media. In our study we will acquire the knowledge to solve some of these issues by applying knowledge of soil mechanics in looking for alternative solutions to these problems, and possibly identifying alternative materials that can be used as more efficient soil media.

28. Species Delineation within the Black Coral Genus *Tanacetipathes*

Sheila Moaleman

Prof. Mercer Brugler

Among cnidarians, black corals (Anthozoa: Hexacorallia: Antipatharia) are noteworthy for their slow rate of evolution within the mitochondrial genome. Variation is so low (antipatharians evolve 50-100 times slower than other multicellular animals) that a potential new species is revealed by a single nucleotide change when analyzing multiple mitochondrial and nuclear gene regions. Antipatharians' slow rate of evolution makes it difficult to use DNA to discriminate between species despite the presence of well-documented morphological differences. Within the black coral genus *Tanacetipathes*, subtle morphological differences between species have led some researchers to name many distinct species without corroborating these claims with molecular evidence. Representative samples of several different morphologically-defined species of *Tanacetipathes* were barcoded using three mitochondrial intergenic regions (igrN, igrW, igrC) and three nuclear genes (18S, 28S, ITS2) to confirm or refute tentative species identifications. Phylogenetic analysis was performed on all newly acquired sequence data to determine the appropriate phylogenetic affinity of each species. Preliminary molecular results confirm the existence of multiple species within *Tanacetipathes*, but simultaneously refute current species delineations. These results suggest that morphological differences used to delineate species are due to environmental differences and thus cannot be used solely for proper identification of these species.

29. Examining the Role of Calpain in Oxidative Stress

Ribert Morette

Prof. Ralph Alcendor

According to Hugo Gene Nomenclature Committee (HGNC), the official symbol for captain 1 is CAPN1. Calpain1 is a family of calcium-activated non-lysosomal, intracellular, cysteine protease which are expressed ubiquitously in cells of many organisms. These enzymes are heterodimers with distinct large subunits that associate with a very small regulatory subunit. Organisms may have several calpains as part of their calpain superfamily. In humans, for example, there about 15 genes encoding for calpains. These calpains are classified as classical, example CAPN1 and CAPN2, or non-classical calpains. Classical calpains contain a C2L and PEF domains, while non-classical calpains exclude C2L and/or PEF domains. Calpains function in a wide variety of cellular processes including preservation of brain function, regulation of the tumor suppressor gene p53, and cell death. One area needing more attention is the role of calpain in oxidative stress

30. The Importance of Constructivism for Identifying Disease

Gisela Morocho

Prof. Daniel MacDougall

The definition of disease has changed drastically over time. The social field of Philosophy has contributed significantly to its changes, with the use of their Constructivist and Objectivist theories. The Constructivist theory uses normative judgments to claim that a disease is subject to change and is depended of consciousness. (Murphy, 2015). While, the Objectivist theory uses empirical judgements to claim that a disease is not subject to change and is independent of consciousness (Murphy, 2015). Together these theories have been influential to labeling Female hypoactive sexual desire disorder (HSDD) as disease, each in their unique way, with the constructivist theory being superior at explaining why it should be. Although both theories where influential to labeling HSDD as a disease, HSDD should not be labeled as a disease.

31. Servo Network Based Heteromorphism Robot

Gene Nadela

Prof. Xiaohai Li

As mechatronics and automation become more ubiquitous, new forms of robotic interaction will need to be developed. A robot is often restrained to fixed positions and modes in order to perform certain tasks effectively. Some robots may be wheeled but this limits its flexibility. Some may be legged, but this limits its overall speed.

The purpose of this project is to design and develop a humanoid robot, capable of bipedal locomotion as well as motorized, wheeled locomotion. The robot will be utilizing multiple servos working in tandem acting at various joints on the system to produce bipedal motion. It may then alter its form with the same servos into a shape that allows all four motorized wheels to make contact with the ground, and permit vehicular movement along its path. Bipedal motion confers an advantage to robots in terms of flexibility and agility; while wheeled locomotion provides speed.

ROBOTIS provides a flexible, consumer grade parts kit that may be used to produce such a robot with additional materials, programming and modification. The robot will need to be thoroughly tested for balance and effectiveness in its humanoid locomotive form, wheeled vehicular form, and most importantly, its transformation between both of those modes. A significant portion of the project will be dedicated to programming this process of metamorphosis for consistent transitioning.

32. Significance of Entrance Door Infiltration to Building Environment

John Paschos

Prof. Daeho Kang

This project investigates energy processes with entrance doors to a building. It shows how much energy is lost through the doors. When there is unwanted infiltration of air through the doorways, there is a contribution to building energy consumption. There are many factors that will affect the results of temperature. They are: the types of doors being used, the frequency of the opening of the door, the temperature on the outside, and the temperature inside of the building. Various markers of air quality were measured including, temperature, humidity, frequency of the opening of the door, and carbon dioxide levels as well. These measurements were taken both in Voorhees Hall and the Environmental Building using various meteorological instruments. In both buildings measurements were recorded in the lobby and at double swinging door entrance. This experiment was completed on a spring day. It was found that variations in the temperature of the lobby relied on the frequency of the opening and closing of the doors.

33. Mental Health Conditions and Pharmaceutical Regimen

Jawad Rashid

Prof. Justine Pawlukewicz

This project showcases the impact of mental health conditions in today's society and current practices, specifically psychotropic medications. While many are aware of mental health conditions, they need to know the criteria for specific common conditions and the medications that warrant stability or remission. By using the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) an assessment and overview of mental health conditions was formed and the use of pharmaceuticals for best practices was deciphered.

In the research, criteria for mental health conditions were established utilizing the DSM-5 handbook and ICD-10 codes. Co-morbidity of conditions was also established to better comprehend the degree of symptoms manifested in patients. Extensive pharmacological data was probed to see the effects of various drugs on neurological functioning, side effects, and benefits and effects of use and non-compliance. In addition, community impact on mental health, cultural considerations, and stigmas were analyzed for community advocacy and policy implementations.

34. Black Males Hiring Rates Are Low, and Acknowledgement Rates Are Lower. Reasons Why, and How We Can Improve This Problem

Darius Richards

Prof. Dan Wong

The issue of my project is that black males are not getting enough job opportunities. My plan is to educate and empower black males in low income community by creating an informative zine. In society, there has been many situations that contributed to the low percentage rate of black males being hired. Some situations in this zine are incarcerated, drugs, low income families and the environment, and schools. This zine will be providing factual proof and percentages of the hiring rate of black males, and go in depth on how black males can improve their opportunities in society. Some topics I will be discussing is knowing how to present yourself, taking advantage of workshops, and life adjustments. There will be two solutions to solve this problem. The first solution is educating black males on their situation and helping them be self-aware of the issues that surround them. The second solution would be how to produce more funding for black males to be hired at local industries. From this project, I hope to empower black males and find a solution to create more funding for companies to hire black males.

35. Brooklyn Korean War Veterans Plaza

Kameisa Richards

Prof. Michael Duddy

This project explores how the Korean War Veteran Plaza, which is located at Cadman Plaza East between Tillary Street and Johnson Street, came to be. Despite the large flagpole designating it as a plaza, the inscribed list of 340 names on the granite wall facing Tillary Street, and a large white sandwich board with navy blue lettering indicating that it is a memorial plaza, it is overlooked and unnoticed. The Korean War has the unfair distinction of being called “the forgotten war.” This project sought to answer through investigation of the archives of the Parks Department, the Brooklyn Public Library- Brooklyn Collection, and interviews with a veteran and officials in the Parks department the question of how this memorial plaza arrived at that location, and in extension, the significance of the Korean War as it relates to the present day. Due to its occurrence between WWII and the Vietnam War, the Korean War was lost in the narrative of history, and in a way, as the actual war itself, the Brooklyn Korean War Veterans plaza has also been “forgotten” as a testament to the courage and bravery of the 340 men from Brooklyn who were killed in hostile action, captured or deemed as missing. The plaza has become a physical embodiment of the metaphorical “forgottenness” of the Korean War in history’s narrative.

36. Luxury Advertising: Gender Portrayal, Sexual Objectification, and Brand Loyalty

Alyssa Roces

Prof. Alyssa Dana Adomaitis

Advertising is a medium for brands to market, sell, and promote their products to persuade their target consumers to purchase the product. Research has shown that since modern day advertising began, marketers have used sex to promote their goods and services (Sivulka, 2003). In fashion magazines such as Vogue, Harper’s Bazaar, and Elle, luxury fashion brands use print advertisements that market their products using sexual objectification of women. Sexual objectification is when a woman’s body parts are used as an object or prop for consumption, stripping her of individuality and personality (Fedrickson & Roberts, 1997). Even with sexual explicit advertising,

consumers are loyal to purchase luxury brands. In order to investigate, the Stimulus-Organism-Response (S-O-R) model (Mehrabian & Russel, 1974) will be used to measure how consumers react to sexually explicit, luxury print advertisements, and if brand loyalty is a factor in their purchasing decisions. Advertisements from luxury brands such as Gucci, Chanel, and Dior, will be analyzed from fashion magazines within a 6-month period which reflects one fashion season. Using categories developed by Ivas (2000), advertisements will be assessed for gender portrayal and use of sexual objectification. In order to conduct research, a semi-structured interview with luxury advertisements will be conducted after an IRB approval. Results will then be discussed maintaining anonymity of all participants.

37. Unpacking the Role of the “Wall” in History as a Primary Element of Architecture and Urban Planning
Heraldi Sadmojo
Prof. Claudia Hernandez Feiks

38. Studying the Over-Diagnosis of Mental Illnesses in Children of Low-Income Families
Gideon Sargeant
Prof. Gulgun Bayaz Ozturk

The purpose of this study is to find the prevalence of ADD and ADHD by poverty status of the children in the United States. The mental illness we focus on is Attention Deficit Disorder (ADD) and Attention deficit hyperactive disorder (ADHD). The National Institute of Mental Health defines Attention deficit/hyperactive disorder as “a brain disorder” marked by an ongoing pattern of inattention and/or hyperactivity - impulsivity that interferes with functioning or development.

39. Analysis of Students’ Progress and Workshop Participation in Peer-Led Team Learning in Foundational Mathematics Courses
Farjana Shati
Prof. Janet Liou-Mark

New York City College of Technology has adopted the Peer-Led Team Learning (PLTL) instructional model in foundational mathematics courses. This study examined the factors that may have contributed to the success of the students enrolled in the special sections that had an additional one-hour peer-led workshop. The results from the study are presented.

40. Robo-Queen II
Jennifer Solomon
Prof. Farrukh Zia

In an earlier research project, a prototype robotic mannequin was designed and developed by using low cost construction material and open source low cost computer hardware and software components. The first prototype had basic features such as arm and head movement and speech synthesis implemented successfully. In this second phase the robotic mannequin hardware design is improved by utilizing a more robust construction technique. An improved speech synthesis program is used to control the

pitch and speed of mannequin's speech. In addition, the circuit for making the LED lips and eyes to light up, has been improved to allow better synchronization between speech, lips and eyes. The new and improved robotic mannequin will be used in showcasing the use of computer technology in classroom demos and through participation in technology fairs.

41. Simulation of Robotic Arm
Rumana Hassin Syed
Prof. Farrukh Zia

In an earlier phase of this research project last semester, a robotic mannequin was built using very low cost off the shelf materials. The mannequin was programmed to interact with people and greet them by using voice synthesis software such as eSpeak. Some progress was also made towards the goal of controlling the mannequin's head and arm movements through kinematics. In the current phase of the research project MATLAB / Maple based computer simulation and animation is implemented to study forward and inverse kinematic equations and their solutions. A method is proposed to use kinematics to control the arm movements.

42. Hydrogel Fabrication Using Maskless Photolithography
Joyce Tam
Prof. Ozlem Yasar

In the field of Tissue Engineering, fabrication of engineered scaffolds is vital to guide the tissue growth and replacement. Scaffolds can be fabricated by using light, heat, adhesives and molds. However, fabrication of 3-D thick scaffolds is always a challenge due to desired design characteristics. Failure of precise scaffold fabrication cause improper tissue regeneration. Recent study shows that light based scaffold fabrication techniques has more advantages than other techniques as it generates the minimum toxicity. In this study, scaffolds are generated by a light-based fabrication technique that is known as "maskless photolithography". In this technique, Polyethylene (glycol) Diacrylate (PEGDA), which is biodegradable and biocompatible polymer, is used as a fabrication material. UV-light is shined on a "Digital Micro-mirror Device (DMD)" and it is selectively reflected to PEGDA solution. Illuminated area gets solidified and generate the hydrogels whereas non-illuminated area remains in the liquid form. Our fabrication results show that scaffolds can be fabricated layer-by-layer fashion by "Maskless Pholotolithography". This technology can be easily applied to engineered living systems

43. Gardening the Backyard to Connect our Communities and Green the City
Mei Zhu
Prof. Sean P. Macdonald

This research focuses on making use of the empty space available in the backyard to plant and cultivate fruits and vegetables. The purpose of this research is to promote and popularize planting in the backyard to become more connected to nature and nurture a sense of community. There are many benefits that can come from developing these new social skills: saving and spending less on fresh fruits and vegetables, reducing our carbon

dioxide emissions, refreshing the air around us, and making our living environment more enjoyable and colorful.

The main goal of this research is to illustrate how we can make this happen in our real lives and to encourage more people to consider this practice as an important part of their environmentally conscious behavior. The research material will be collected from research articles and updated news. This information and knowledge can educate us about how to live in the ideal world and how we can improve our environment by greening the city.
