Book of Abstracts

The Emerging Scholars Program

Fall 2015

Supported by New York City College of Technology

Title: Canvas: Drawing Graphics and Creating Animations in the Browser
Student Researcher(s): Hibba Abbas
Faculty Mentor: Prof. Marcos Pinto

This project demonstrates the power of drawing graphics and creating animations directly in the browser by using Canvas, a 2Ddrawing API recently added to HTML5 and supported by most browsers. Canvas allows you to draw anything you want directly in the web browser without the use of plugins like Flash or Java. With its deceptively simple API, Canvas can revolutionize how we build web applications for all devices, not just desktops.

Title: Implementing an Online Quiz with Countdown Timer

Student Researcher(s): Joe N. Abellard
Faculty Mentor: Prof. Marcos Pinto

Project consists of designing and implementing an online quiz with a countdown timer using Javascript programming language.

Title: Using next generation sequencing technology to eludicate microorganisms

Student Researcher(s): Fabiola Fontaine
Faculty Mentor: Prof. Jeremy Seto

There is much interest in examining the effects of human activities on water sites in urban areas. Many studies have utilized classical microbiology techniques to examine the abundance of microbes in the water. More recently, next generation sequencing has been used to examine prevalence of microbes in a variety of sites and has led to great insights. The proposed project will examine two sites in Brooklyn, one with little human activity, Greenwood Cemetery and the other one with extensive human activity, Newtown Creek and compare the microbes in both using metagenomics.
To date, examination of sites in Brooklyn, Green-Wood Cemetery and Newtown Creek have been performed and mapping were done to establish the sampling areas. Four sites in the cemetery were sampled, in Summer and Fall 2014 (Dell, Sylvan, Crescent, Valley). Also four sites of the Newtown Creek were sample too, in Winter 2014 and Spring 2015 (Hunter point,

Ash St, Maspeth, Nature).Visual surveys of the biodiversity were done as well as taking into account the location of human activities such as sewage outflows. The flora and fauna were assessed. Water samples were filtered through 0.2 µm and 0.45 µm filters and the DNA extracted. Extracted DNA was sent to a company for PCR amplification and DNA sequencing. The results from Greenwood Cemetery were obtained and were submitted to databases for analysis and modeling and statistical analysis to perform and to assess the relationships of human and animal activities with the biodiversity of the water bodies.

Future work will involve the analysis of the data of the second water site, Newtown Creek. Then a comparison of the biodiversity of the 2 site will be done; while looking for any organisms that could be used as biosensors.

Title: Towards Automatic Migration of Legacy Java Method Implementations to Interfaces

Student Researcher(s): Md Arefin
Faculty Mentor: Prof. Raffi Khatchadourian

Java is one of the most popular programming languages among software developers and heavily used by industry. Java 8 is one of the most significant upgrades to Java programming language and framework. This upgrade provides support for functional programming, a new JavaScript engine, new APIs for date time manipulation, lambda expression, a new streaming API, and so on. There are several new key features of Java 8 that can help make programs easier to read, write, and maintain. We investigate developing a new technique that will be of great value to software developers in automatically evolving existing Java software to take advantage of default methods, which make implementing Java interfaces easier.

Title: Antimicrobial properties of paint tested with Staphylococcus epidermidis

Student Researcher(s): William Bennett
Faculty Mentor: Prof. Jeremy Seto

Incidents of infections have been increasing due to factors such as non-hygienic behaviors and the increase of drug-resistant bacteria.Such factors can prove to be deadly in certain conditions and environments. People that have a suppressed immune system, elderly,and young children are just a few examples of those that cannot have this risk. Environments such as hospital settings, nursing homes, and daycares are places that you wouldn't want to have bacteria present. One way we can prevent these incidents from happening is to manufacture products that inhibit the growth of microbes. For this research, we will be testing Staphylococcus epidermidis on a surface using paint with purported antimicrobial properties.

Title: Chronicling the achievements and activities of Honors Scholars at City Tech

Student Researcher(s): Savannah Blodgett, Juan Carpinteiro, Mariah Rajah, Jessica Samide, Jodieann Stephenson and Jane Tan
Faculty Mentor: Prof. Reneta Lansiquot

Scholars, the Honors Scholars Program newsletter contains articles, student achievements, and experiences as well as information on program activities. A student-driven publication, each issue showcases the skills of students serving as photographers, editors, graphic artists, technical writers, and reporters. Responsibilities crucial to this major interdisciplinary project include going to scholarly presentations, attending workshops, conducting interviews, creating layouts, editing texts, taking photos, selecting pull quotes, meeting deadlines, and integrating feedback. We also update our online presence, which can be accessed on OpenLab and the College's Honors Scholars Program website.

Title: Organizational Planning and Evaluating within the Hospitality Industry

Student Researcher(s): Jovany Bravo
Faculty Mentor: Prof. Patrick O'Halloran

Most front office managers will readily admit that they rarely have all the resources necessary to accurately monitor the guest cycle. Resources available to managers include staff members, budgeted funds, work shifts, materials and equipment. All are in limited supply. An important part of a front office manager's job involves planning how to apply limited resources to attain the department's objectives. An equally important function is evaluating the success of front office activities in meeting the department's objectives.

Title: Security and the Lodging Industry

Student Researcher(s): Michelle Cantos
Faculty Mentor: Prof. Patrick O'Halloran

Lodging property managers have many responsibilities, one of which is security. From the earliest days of the hospitality industry, one of the most important duties of an innkeeper has

been to protect guests from harm while on the property. Although interpretations of protection may vary from state to state, every legal jurisdiction imposes some form of security obligation on hotels. Security regulations go beyond the innkeeper-guest relationship to include hotel employees and others on the property who are not guests. Therefore, providing security in a hotel is the broad task of protecting people-guest, employees, and others-and assets. Crimes involving the theft of assets usually result in greater immediate monetary losses to lodging properties than crimes against persons, but crimes against persons have a greater effect on public relations (and therefore occupancy) and may lead to high legal expenses and large punitive damage awards. The industry's concern with security increased dramatically after the terrorist attacks of September 11, 2001. Hotels, because they are so open to the public, are potential targets for terrorist activities. For example, immediately after the tragic events of 9/11, hotels in New York and Washington, D.C., received dozens of bomb threats, including threats to use poisonous gas and other types of destructive devices. Additionally, two prominent hotels were among the targets of the terrorist attacks in Mumbai, India, in late 2008.

Title: Multiple Meanings of Graphic Symbols: Infograms for Anatomy and Physiology

Student Researcher(s): Tristan Charran
Faculty Mentor: Prof. Vasily Kolchenko

Graphic symbols are integrated into the visual media of many kinds – in print, online, and on TV, among others. They are ubiquitous in science learning materials due to the cognitive advantages provided by the graphic symbolic representation. These advantages are particularly widely used in the Infogram learning materials developed for BIO2311, Anatomy and Physiology I, by Dr. Vasiliy Kolchenko at the New York City Tech. The Infograms employ graphic symbols, key terminology, abbreviations, simple charts and diagrams to condense information into an informative visual narrative. The multiple meanings of some graphic symbols may also represent a challenge for underprepared students. For them, the interpretation of the symbol can get lost in translation. Clearly, understanding the meaning of the graphics used in the Infogram is integral for understanding the concepts they represent. In this study, we catalog, describe and cluster some graphic symbols, particularly different kinds of arrows that have been used in the Infograms more than 200 hundred times. Introductory learning steps highlighting the formalized categories of symbols and their meanings are suggested.

Title: Efficient Filtering of Noisy instances in Big Data using Ensemble Classifiers

Student Researcher(s): Rosemary Chinchilla
Faculty Mentor: Prof. Ashwin Satyanarayana

In a broad range of application areas, data is being collected at unprecedented scale, which is being used for Big Data Analytics in nearly every aspect of our modern society, including mobile services, retail, life sciences and physical sciences. In this project we use multiple classifiers (models) to filter out noisy instances and hence improve the quality of the data for analysis. We use a majority vote filter technique with cross fold validation. We have successfully implemented our technique in about 10 datasets.

Title: The relationship between communication and guest service in the Hospitality Industry

Student Researcher(s): Blanca Cortes
Faculty Mentor: Prof. Patrick O'Halloran

Hospitality front office Communications involves more than memorandums, face-to-face conversations, e-mail and text messaging. Effective front office communication also involves the use of transaction files, information directories, internal and external networks, search engines and mail and telephone procedures. The complexity of front office communication tends to be directly related to the number of guestrooms and the size and extent of the hotel's public areas and facilities. The larger the hotel and the more people involved, the more complex the communication network. Even in small hotels, establishing and maintaining communication links can be more complex than anticipated.

Title: Effects of Age and Psychiatric Diagnosis on Saccadic Eye Movements

Student Researcher(s): Rafael De Jesus
Faculty Mentor: Prof. Daniel Capruso

Aim: The aim of the project was to determine the relationship of age and psychiatric diagnosis to saccadic eye movements in a clinical sample.

Method: Subjects were 34 psychiatric hospital inpatients, 29 male and 5 female, ages 22 to 72 years. Psychiatric diagnostic groups were of schizophrenia (n=17), schizoaffective disorder (n=8), and bipolar disorder (n=5). An infrared eye tracker was used to measure saccadic eye movements and foveal fixations during a 10s stimulus exposure. The optical stimulus was a dramatic painting in the realistic style depicting the interaction of several human figures inside a domestic space. Subjects were excluded from the correlational analysis, if the eye tracker was unable to sample their eye movements for at least 50% of the exposure time.
Results: The relationship between age and the number of saccadic eye movements was in the expected direction, but was not significant, $r\ (n=24) = -.12$. The number of saccadic eye movements did not differ significantly between the three diagnostic categories, $F\ (2, 29) = 0.54$.

Subjects had a mean of 22.43 (SD = 8.67) eye movements over the exposure interval (approximately two per second).
Discussion: In this sample of psychiatric patients, the effects of advancing age on the number of saccadic eye movements during complex scene viewing was not significant. Likewise, psychiatric diagnosis did not produce group differences in the number of eye movements. These results may help determine whether age and specific diagnosis might act as confounding variables in future studies.

Title: Developing a new pedagogy for experiencing Mechatornics

Student Researcher(s): Darya Dubouskaya
Faculty Mentor: Prof. Muhammad Ali Ummy

Mechatronics teaches how to design or select sensors, actuators and develop control algorithms for any mechanical systems. The goal for this project is to give the students a firsthand experience of designing/controlling a simple system using the state-of-the-art equipment manufactured by National Instrument. Students will enhance their designing and programing skills by creating platforms for controlling various systems.

Title: Oral Cancer Diagnosis and Emerging Medical Technologies

Student Researcher(s): Nephtali Guillomaitre
Faculty Mentor: Prof. Gwen Cohen-Brown and Prof. Laina Karthikeyan

With approximately 30,000 cases of oral cancer diagnosed each year, the disease is more prevalent than melanoma. So why is it that only 20 percent of dental offices perform oral cancer screenings on their patients? Oral cancer screening saves lives and should be a routine part of your annual dental visit. It is painless and can easily be completed in a few minutes. This research project examined the role of Emerging Medical Technologies in Oral Cancer Screening. These devices claim to help practitioners detect oral mucosal abnormalities that otherwise would be difficult to discern on routine visual examination. The jury is still out with respect to efficacy of use and transferability of knowledge when assessing lesions found using emerging medical technologies.

Title: Running simultaneous Javascript with WebWorker

Student Researcher(s): Preeti Gurung
Faculty Mentor: Prof. Marcos Pinto

Project demonstrates the efficiency of HTML5 feature called WebWorker which are Javascript programs that run in the background without affecting the Web page. WebWorker brings threading to Web pages, thus the notion of a Web page doing things simultaneously.

Title: Copper Binding Properties of Multi-Target Compounds. Implications in Alzheimer's disease Therapy.

Student Researcher(s): Sarah Hambleton
Faculty Mentor: Prof. Alberto Martinez

Alzheimer's disease (AD) is an irreversible and progressive brain disorder that eventually leads to the loss of ability to carry out even the simplest tasks. This form of dementia, that affects more than 5 million Americans and 28 million people worldwide, is characterized by the formation of Amyloid-beta (A□) plaques and reactive oxygen species (ROS). Current treatments are symptomatic and none of them interdicts the underlying cause of AD. Therefore, there is an urgent need for viable chemotherapies that target the root of the onset and progression of the disease. Metal ions, specifically Cu2+, are thought to be involved in the advancement of AD in several ways. They promote the aggregation of A□ into toxic forms of the peptide, and their presence is needed to catalyze the production of ROS. In Our work we have assessed the Cu2+ binding properties (stoichiometry and binding affinity) of two multi-target compounds, AM49 and EE229, by means of UV-visible spectrophotometric titrations. AM49 and EE229 belong to a family of compounds that are designed to chelate toxic concentrations of Cu2+ ions, to inhibit both ROS formation and A□ aggregation, and to interact with enzymes that are relevant to the progression of AD. In our experiments we found that AM49 and EE229 form 2:1 (compound:Cu2+) complexes with Cu2+ and display a binding affinity that can allow competition with A□ peptides but not with needed metalloenzymes. Based on our results these multi-target compounds show promising potential in the search for disease-modifying therapies against AD.

Title: Microbiology of the built environment: The changing microbiome of New York City College of Technology

Student Researcher(s): Manuela Hoyos

Faculty Mentor: Prof. Davida Smyth and Prof. Jeremy Seto

There is much interest in understanding what constitutes the microbiome of buildings. The surfaces of buildings can often harbor pathogens, acting as fomites, capable of transmitting pathogens to hands. A better understanding of how bacteria transmit from surfaces to human hands would reveal insights into how bacteria prevail and persist in the environment potentially enabling better surveillance and prevention of the dissemination of community-associated and hospital associated bacteria. To address these questions, we have been sampling the biodiversity of a particular genus of bacteria, the Staphylococci, in our academic building over three semesters. We have focused our sampling on elevator buttons of the NAMM building, composed of 11 floors. Each button was sampled using a chromogenic contact plate, selective for antibiotic resistant Staphylococci on a single day at the same time to get a snapshot of circulating Staphylococci. Presumptive Staphylococci were sub-cultured, DNA was extracted and subjected to PCR and sequencing to identify the species. We have also surveyed for total bacterial load using metagenomics in occupied and non-occupied buildings of CUNY. Our poster shall describe our findings to date and reveal insights into the non- and potentially-pathogenic microbial residents of our campus.

Title: Comparison of Free Vulnerability Scanners

Student Researcher(s): Nolan Hu
Faculty Mentor: Prof. Arup Das

There are many vulnerability scanners that advertise as the best product. The goal is to compare and contrast the scanners and determine whether they are as good as they claim to be. The comparison will test community edition and open source scanners.

Title: Evaluating the Automation and Competencies of the Hospitality Front Office Audit

Student Researcher(s): Malika Ikramova
Faculty Mentor: Prof. Patrick O'Halloran

Since hotels operate twenty-four hours a day, seven days a week, front office management must regularly monitor the accuracy and completeness of guests and non-guest accounting records. A front office audit procedure is intended to fulfill this requirement. The front office audit is a daily comparison of guest account transactions recorded in the front office system or at the front desk against revenue center transactions. This routine helps guarantee the accuracy, reliability and thoroughness of front office accounting. The front office also may include active non-guest accounts. A successful audit will result in balanced guest and non-guest accounts,

accurate account statements, appropriate account credit monitoring and timely reports to management. An effective front office audit also increases the likelihood of correct guest and non-guest settlement.

Title: Computational Structure Prediction of Protein Kinase A

Student Researcher(s): Elizabeth Kolmus
Faculty Mentor: Prof. Mai Zahran

Phosphorylation is the most common and well-characterized signalling method that eukaryotic cells use to regulate biological processes. Cyclic-AMP-dependent protein kinase (PKA) is a model enzyme for studying the phosphorylation process, making understanding it critical to many other lines of scientific inquiry. It is challenging to study the structure of PKA using high-resolution experimental methods, because it is too large for NMR and contains portions that are too flexible for X-ray crystallography. In this study, we used computational modeling to suggest a possible structure for the complete PKA enzyme. The model is based on the most complete high-resolution data available for the enzyme, as well as additional data gathered in lower-resolution experiments. Our initial analysis of the model seems to suggest that it is a good representation of the *in vitro* molecule. Further analysis and molecular dynamics studies will help us confirm that this is the case.

Title: Salvation behind the closet door

Student Researcher(s): Felix Kurniawan
Faculty Mentor: Prof. Eric Rodriguez

Mr. Kurniawan is a student in Dr. Rodriguez's Personality Psychology class (PSY 2402, section #E746) for the Fall 2015 semester. Research has shown that the best way to learn new material is to apply that material to yourself. This idea forms the foundation of what Felix will be working on this semester for his honors project - both personal identity exploration as well as understanding the underlying psychological theory and research that speaks to his individual life experiences. The purpose of this student/professor collaboration will thus be three-fold: 1) To introduce Mr. Kurniawan to the psychological literature (from both theoretical and methodological perspectives) on sexual minority people of faith; specifically Dr. Rodriguez's published work in this area where he is an internationally recognized expert; 2) For Mr. Kurniawan to learn how to conduct and write a proper literature review; and 3) For Mr. Kurniawan to obtain his CITI human subjects research training certificate. The overarching goal of this project is thus to expose Mr. Kurniawan to the psychological literature which will form the foundation (i.e., the literature review) for his Spring 2016 honors project, which will contain a

human subjects research component, while better preparing him for a career in human services at the same time.

Title: Rethinking Etiologies and Treatment of Neuropathology based on the Meningeal Lymphatic System

Student Researcher(s): Stella Lee
Faculty Mentor: Prof. Niloufar Haque

Until very recently, we believed one of the many salient characteristics of the central nervous system to be the absence of a lymphatic system. We have since discovered that a series of channels exist that function as a classical lymphatic disposal system. A method to examine intact meninges fixed within the skullcap allowed for a view of the physiological condition, which unveiled lymphatic vessels. Consequently, living imaging was used to verify the existence of meningeal lymphatic vessels that line the dural sinuses. The vessels had evaded detection based on their location The implications of a meningeal lymphatic system challenge our fundamental approach to neuroimmunology and have far reaching impacts on the possible mechanical pathway disruptions on the etiology of neurological disorders like multiple sclerosis and Alzheimer's disease.

Title: Sustaining an Online Writing Program

Student Researcher(s): Ricky Martinez
Faculty Mentor: Prof. Reneta Lansiquot

This research project involved the research of PHP code to repair, maintain and enhance an original writing program/website, running on a content management system (CMS) called Drupal, that provides feedback on writing to first year college students (see http://www.citytechpalace.org). The research involved research of various patches to problems as well as facilitating and improving the flow of the website so that using it is easier to students. Through the implementation of patches and upgrading the current CMS, the program has become more fluid and easy to use.

Title: Advancing Microbes – Humans Keeping one Step Ahead?

Student Researcher(s): Linalee Moreira
Faculty Mentor: Prof. Elaine Leinung

The existence of microorganisms was hypothesized for many centuries before their actual discovery. Early claims about the existence of microorganisms were speculative, and not based on microscopic observation. In 1676 Antonie Van Leeuwenhoe**k** discovered microbes using a microscope of his own design and the field of microbiology was "born." While most microbes are harmless and many are even beneficial, some are extremely dangerous and can cause serious and often fatal illness. In 1928 Alexander Fleming discovered penicillin. This discovery of antibiotics changed the way medicine is practiced and health care is delivered. The Human lifespan has increased and people are healthier today than they were150 years ago: cleaner water, air, and food; safe disposal of sewage; better nutrition; more knowledge concerning health behaviors. However the threat of an epidemic remains as Humans have grown complacent but microbes continue to evolve. Microbial resistance to antibiotics has grown faster than new medications can be developed. The microbes are advancing and Humans must change their behavior to keep one step ahead.

Title: Mechanics of Tissue Scaffolds

Student Researcher(s): Arturo Axel Murillo
Faculty Mentor: Prof. Ozlem Yasar

Tissue Engineering is an interdisciplinary field that applies the principles of Engineering and Life Sciences to restore the function of a whole organ or tissue. One of the key components of Tissue Engineering is scaffolds. Scaffolds are 3D manmade structures that are used to help cells to migrate and grow in the three dimensions. Materials that are used to fabricate the tissue scaffolds must be chosen carefully to be consistent with the tissues where they are to be implanted. Fabricating scaffolds with the right mechanical properties is a challenge in Tissue Engineering. In this research, poly (ethylene glycol) diacrylate (PEGDA) is used as a biomaterial. 20%, 40%, 60%, and 100% PEGDA is fabricated in a "dog-bone" shape to do tensile tests. The preliminary research shows that, tensile strength strongly depends on the PEGDA percentage and 100% PEGDA has the highest tensile strength whereas 20% PEGDA has the lowest tensile strength.

Title: Using mobile communication to reduce maternal and infant mortality

Student Researcher(s): Michelle Negron-Leon
Faculty Mentor: Prof. Karen Bonsignore and Prof. Noemi Rodriguez

Emerging as a useful tool in the United States, as well as other developed and developing countries, particularly where access to health care services, such as antenatal care, is limited is Mobile health (mHealth). Complications can develop during pregnancy, most of which are preventable, and puts women at risk of developing them at any time during pregnancy, childbirth and postpartum. A common factor in neonatal mortality is the health of the mother. Mobile communication aims to improve the health outcomes, and modify behaviors, of pregnant women, and inadvertently infants, by providing access to health services and information.

Title: Proposals for the Reintegration of Public Housing in New York City

Student Researcher(s): Cindy Ocasio
Faculty Mentor: Prof. Ting Chin and Prof. Jason Montgomery

As the population in New York City continues to increase there is a growing demand for housing at all levels of affordability. Although the high-end residential market is thriving, the mechanisms for providing affordable public housing are failing. With a population of over 400,00 residents throughout five boroughs, the New York City Housing Authority (NYCHA) operates the largest public housing system in the United States and yet billions of dollars in underfunding from all levels of government, outdated and inefficient management, and rapidly deteriorating buildings have jeopardized its future. Urbanistically and architecturally many existing NYCHA properties also suffer from design decisions that applied a radical large scale redevelopment approach at the time in which there were conceived but have now been proven to be detrimental to both the residents and the city. The tower in the landscape design of most NTCHA developments undermines active and diverse streets creating superblock that separate the developments from the surrounding communities. Their scale, lack of a street wall, break from the normative street grid and severe design uniformity leads to an overt separation of the housing complexes from their adjacent neighborhoods. This separation leads to social and economic isolation, generates safety concerns and hinders opportunities to integrate these residents into diverse and vibrant neighborhoods.
Housing developments that are integrated with their surrounding communities have been proven to be both socially and economically beneficial to both the residents of the developments and the surrounding community. This study posits that the redevelopment og the NYCHA properties is an opportunity to not only increase the number and quality of affordable housing units but to also reintegrate the developments back into the urban fabric. This Project uses the Farragut Houses, a NYCHA property in Brooklyn, as a case study that propositions a phased redevelopment of the housing complex that provides economically sustainable new public housing for the existing residents, mixed-income housing for new residents and reestablishes the development site as an integral part of the larger urban precint.
Two options for the redevelopment are studied and evaluated for their economic viability and impact on the urban environment. Option one maintains the existing NYCHA buildings and infills new mixed-income housing on the open space around them. The income generated from the new mixed-income housing (combinations of affordable and market rate) will be used to repair

and maintain the existing public housing units. This option os referred to as the “Infill” option. Option two involves two phases. During phase one existing NYCHA residents remain in place while new buildings with public housing units are constructed. When the new buildings are completed the NYCHA residents move out of their units and into the new buildings. During phase two the existing NYCHA buildings are demolished and new mixed-income housing (combination of affordable and market rate) are built on the newly available land. This new mixed-income housing could then be sold and the profits used towards maintaining the public housing units. This option is referred to as the “Phased” option. Both options are guided by a contextual design approach that seeks to knit new streets, buildings, blocks, and public spaces into a natural design flow and sympathetic relationship with the network of the urban streets and blocks north, south, and west of the site.

Title: Web Application Mashup

Student Researcher(s): Khadijah Okoh
Faculty Mentor: Prof. Marcos Pinto

Project shows how to create a Web page containing several Web applications (mashup) for intentions of informing, entertaining, and/or assisting the user.

Title: Fractional Calculus Differential Equation

Student Researcher(s): Yen Pham
Faculty Mentor: Prof. Satyanand Singh

In this exploration, we study methods of solving differential equations with fractional powers. Our techniques employ the Riemann-Liouville differintegral and Caputo differintegral to transform equations from fractional order into ordinary differential equations and solve them based on knowledge in differential equation courses. It is easy to comprehend but it provides powerful tools that are widely used in engineering, physics, economics etc. One of the most significant results in this study is to solve the tautochrone problem.

Title: Identification of SCCmec Positive Types of Staphylococcus Epidermidis at The New York City College of Technology

Student Researcher(s): Valentina Pineda
Faculty Mentor: Prof. Jeremy Seto

Staphylococcus epidermidis is the most frequent cause of hospital acquired infections, and it has quickly acquired drug-resistance to a variety of antibiotics2. 23 strains of Methicillin resistant Staphylococcus epidermidis were isolated from elevator buttons at NYCCT. These strains were cultured and tested for the existence of the Staphylococcal cassette chromosome mecA , which is the carrier of the methicillin resistant determinant. By using polymerase chain reaction and agarose gel electrophoresis we were able to infer that most strains are carriers of SCCmecA, therefore they are methicillin resistant. In the future we will sequence each strain to characterize them properly.

Title: Spherical crash-free aerial craft

Student Researcher(s): Tenzing Rabgyal
Faculty Mentor: Prof. Xiaohai Li

In this research project, we aim to design and develop a spherical copter for assistive navigation system. The system can aid people with difficulty in navigation due to physical impairment or environmental constraints. To make the aircraft crash free and protect the rotors and electronics onboard, we develop a unique design for its outer body; a spherical structure with hexa-shape using special designed rods and joints. Thus far, we have managed to design and 3d print the entire spherical body (excluding electronic components and rotors), and also tested the helicopter so that it can hover.

Title: Godin's Social Palace: A Behavioral and Architectural Assesment

Student Researcher(s): Zakarya Samih
Faculty Mentor: Prof. Michael Duddy

A few kilometres from the Belgian border, The Familistere[1] of Guise in northern France is a unique utopian experiment in socialist architecture which had sprung to life during the second half of the 19th century under The Second French Empire[2]. It was the French self-made industrialist, Jean-Baptiste Andre Godin, who ushered into existence this widely celebrated achievement. The iconic complex intended to celebrate and infuse into his workers the very essence and integrity of family life. As a philanthropic endeavour to restore France's proletariat

to a moral and active agent of his nation's social fabric, The *Familistère* was also conceived so as to insure maximum productivity through the conceptual prolonged incentivising of his workers with as little necessary investment as possible. He was a moral capitalist, if it was ever a possibility, and believed that he was directly responsible for the wellbeing of those he employed. He vowed to materialize the late Charles Fourier's dream of a social palace. Fourier was a prominent figure in what Karl Marx[3] called "*The Utopian Socialist Movement*"[4]. Modelled on the Palace of Versailles[5], The Social Palace would house the most disenfranchised. Instead of providing opulence, it would service the functional requisites of a home for thousands whom otherwise couldn't afford it and satisfy its collective population with healthy, proficient and fulfilling lives. Godin's *Familistère* housed over a thousand people in three-hundred apartments. He saw his conceptual design of the housing for his employees as the dwelling of the modern age and offered his residents a range of otherwise inaccessible amenities which he termed "*the equivalence of wealth*"[6]. As an active reformer, Godin explored with meticulous clarity the interplay and significance of space and behaviour. He rationalized his innovations using the revolutionary proficiency of the Factory as a template: "*The ideal must be embodied in a superior form of architecture, which would be to the simple house what the factory is to the workshop*" (Godin)[7]. His conceptual designs and the success of the *Familistère* would attract the writers Emile Zola[8] and Hector Malot[9], and invite the commentary of Fredrick Engels[10]. It would present itself as the main inspiration for le Corbusier's "*Cité radieuse*"[11] and echo the logic of Jane Jacobs[12] and Oscar Newman[13]. Godin recognized the difficulty in materializing a successful architectural manifestation of social reform. He understood that it was the aspect of behavioural psychology which rendered this task difficult. Before tackling the various issues social housing imposed, Godin would have had to explore the interrelationship of behaviour and space, a concept that was not at all alien to manufacturers, as activities in a factory were observed, studied, ordered and rationalized in order to produce favourable results.

Title: Web Application With Google Map API Web services

Student Researcher(s): Elvis Sanchez
Faculty Mentor: Marcos Pinto

My project is based on how we can use a variety of different apps to help support searches based on the Google Maps service. We already know that Google Maps implements Ajax and Javascript to display the maps and direction in real time, but how are those kinds of programs implemented, what other programs are at works, and why do we use them instead of other programs, like XML. In my poster I will show each different kind of programing language that were use and show what he program does while on your browser to make Google Maps as sufficient as people believe it to be.

Title: A comparison between gas-phase and stellar metallicity in SDSS galaxies

Student Researcher(s): Roberto Serrano
Faculty Mentor: Prof. Viviana Acquaviva

In the study of galaxy formation and evolution, one property which provides great insight into how galaxies form is the metallicity of the galaxy. Metallicity is defined by astronomers as the abundance of elements heavier than helium. The origins of metallic elements can be found in high mass stars, which produce metallic elements in their core through nuclear fusion. Once the high mass star dies in a supernova, the metals are dispersed into space. The subject of this research is to determine the relationship between the metallicity of free floating gas in a galaxy, and the metallicity once stars are formed from the free floating gas. In our research, we will use estimates of gas-phase metallicity from strong line indicators, and compare those values to stellar metallicity once stars are formed from the free floating gas. In our research, we will use estimates of gas-phase metallicity from strong line indicators, and compare those values to stellar from SED fitting models. We will then analyze the relationship between these two estimates as a function of other galactic properties such as age, stellar mass and dust content.

Title: Building Envelope and Daylight Performance

Student Researcher(s): Lu Chang Wang
Faculty Mentor: Prof. Jihun Kim

The project is an exploration on building envelope design and its influence on daylight performance. The goal is to find a high performing variant in designing a building façade. Inspired by the roof design of The Nasher Sculpture Center by Renzo Piano, the building façade consists of a repeated modular, parametrically designed to form a running bond pattern. In response to occupants' view comfort, the size of the middle portion openings is larger to provide exterior view access. The evaluation of the performance is based on DIVA, a state-of-the-art daylight simulation tool. The criteria are daylight autonomy, summer and winter solstices visualizations, and annual and point-in-time glares. While daylight autonomy is an index to determine if a particular location in the room has adequate illumination annually to perform intended task. Visualization is represented by false color images to show illumination level in the room. The finding is that reducing daylight glare and providing exterior view access improve occupants' visual comfort and promote a well-daylight interior office space.

Title: Styling Web Applications with JQuery

Student Researcher(s): Shanice Williams
Faculty Mentor: Prof. Marcos Pinto

Project shows the intricacies of using JQuery library when developing Web application. With JQuery Web pages content can be rendered on a browser even if Javascript is not enabled and Adobe Flash is not installed. Therefore, no more worries about browser's settings. Also, JQuery

makes animated applications just like Flash. JQuery is free and requires only the knowledge of JavaScript and HTML.

Title: Media Queries: Adapting Web Sites to Different Screen Sizes

Student Researcher(s): Gwenneth Worthy
Faculty Mentor: Prof. Marcos Pinto

Project incorporates media query into a Web page's style sheet thus enhancing the media type methods and consequently allowing site developers to target Web pages style to specific device features.

Title: Peace in Religion

Student Researcher(s): Anika Rahnum, Samiul Mozumder and Rafshanur Islam
Faculty Mentor: Prof. Mark Noonan

Our research project is based on the 3 main religions in the world, which are Judaism, Christianity and Islam. The main goal of the project is to show peace in all 3 religions. We want to show that if few bad people are doing something against the humanity that doesn't necessarily means it's the fault of a certain religion. There are good and bad people in every country and every religion. Extremist peoples don't have the right to claim themselves as religious people or they don't relate to religion, rather they are conspiring against religion. We will demonstrate that the is no harm written in the holy books of these religions especially Islam which is getting a lot of blames from people now a days who judge the religion just by looking at what the less than 2% of Muslims do.

Title: Diversity of Black Corals

Student Researcher(s): Abraham Setiawan and Clyde Harris
Faculty Mentor: Prof. Mercer Brugler

Black corals are carnivorous marine animals, and they are cnidarians. Cnidarians have stinging cells, called cnidocytes. Inside cnidocytes there is a fluid–filled capsule called a nematocyst,

which contains a long, spirally coiled thread. Unlike other corals, black corals have a protein-based skeleton. Black corals are also called thorny corals because of the spines on their skeleton. Approximately 75% of black coral species live below a depth of 50 meters.

Title: "Survival of the Pinkest": Breast Cancer in Young Women

Student Researcher(s): Yasmin Abdallah, Amairani Amaro, Beverley Khan and Sylvia Shin
Faculty Mentor: Prof. Zoya Vinokur

The purpose of the project is to shed light on the fact that breast cancer in young women is possible and to highlight the benefits of early screening. The project will seek to alleviate the fears that early and or regular mammography screening is harmful and address the common misconception that breast cancer may only occur after a woman is of a certain age. This is all in the hopes of educating and encouraging young women to be proactive in promoting breast health and ultimately healthier lives in addition to understanding what a mammography examination entails.

Mammography is a form of specialized medical imaging that involves the use of a low-dose x-ray system which allows a Radiologist to see the insides of the breasts. It is done for early detection and diagnosis of breast disease in women and involves the breast being placed on a platform and compressed with a clear plastic paddle. Women often neglect screening because of fear of being exposed to radiation when, in fact, the equipment is designed in such a way that the lowest possible dose is used in the field of medical imaging. This exposure is sufficient to form a diagnosable image while adequately protecting the other areas of the body not being examined. The American Cancer Society pointed out that the dose a woman receives from a screening mammogram of both breasts is equivalent to the amount of radiation she would receive from her natural surroundings over a period of 7 weeks.

Information obtained via internet research from an organization's website called, "Young Survival Coalition", revealed that young women between the ages of 15 to 39 are being diagnosed with breast cancer which occurs more aggressively with lower survival rates when compared to older women. According to the report, "Breast Cancer Facts and Figures 2011-2012", published by the American Cancer Society, 13, 110 breast cancer cases will occur in women under age 40 and that nearly 1,200 women under the age of 40 die annually from this disease. Additional information obtained from a journal published by the US National Library of Medicine in 2010 mentioned that, "this disease accounts for more than 40% of all cancer in women in this age group."

It became evident that not enough research studies have been performed on this particular issue since the popular belief is that younger women do not suffer from this disease as much as older women do. The most starling information revealed is the fact that cancer in younger women tend to be more aggressive in the sense that they suffer from not only the disease but they can possibly experience early menopause or even challenges with fertility.

In concluding, it can be said that breast cancer is not a bias disease and young women or rather all women should not fear the very thing that can save their lives, a mammography exam. Women should understand that the benefits of a mammography exam far outweigh the potential harm from radiation exposure and regular mammograms do not increase the risk of developing breast cancer or any other type of cancers.

Title: All-atom distance-dependent discriminatory functions for protein structure prediction

Student Researcher(s): Sajjad Abedian and Cristina Lai Zheng
Faculty Mentor: Prof. Armando Solis

Proteins fold into stable structures via a multitude of cooperative intramolecular interactions. In this work, we seek to understand which atomic-level interactions significantly contribute to the stability of folded proteins. This question can be recast into a question of information; that is, we would like to measure how much structural information resides in various interacting (heavy) atoms in the protein. For our calculations, we use a large non-redundant set of high-resolution protein structures that were solved experimentally via X-ray crystallography. Our approach, based on information theory, calculates distance-dependent probability distribution functions for every atomic pair, from which a formal evaluation of information content can be made. These probability distribution functions can be turned into knowledge-based potentials easily, using the equivalence between mutual information and mean “energies” of native structures. Identifying highly informative atomic interactions should greatly simplify such knowledge-based potentials, and make them more computationally efficient and tractable. Evaluation will be done using extensive fold recognition tests, involving a search of the native conformation in a vast sea of decoy conformations. We intend to compare our information-optimized discriminatory functions with a number of other potentials described in the literature that have been derived through other approaches.

Title: The Effect of Oxidative Stress on Sirtuins in Tetrahymana thermophile

Student Researcher(s): Victor Adedara and Faaez Nafiu
Faculty Mentor: Prof. Ralph Alcendor

Sirtuins are a class of proteins that possess either histone deacetylase—more commonly—or mono-ribosyltransferase activity. Sirtuins are named after Sir2 (Silent Information Regulators 2), the cell-regulating yeast gene silent mating-type information regulation. Sirtuins regulate critical biological pathways in bacteria, archaea and eukaryotes. In yeast, for example, they are responsible for cellular regulation, longevity and many other important functions. In humans, there are seven Sirtuins, SIRT1 through SIRT 7. SIRT1 helps to promote survival by protecting cells during times when food (and therefore energy) is scarce. In many different cell types the sirtuins also favor survival under stress. Although the amount of information on Sirtuins and their effects on eukaryotic cells is extensive, there is still much more to be discovered about the complete role of these enzymes. One area that has not been examined is the role of these enzymes in Tetrahymena thermophila.
Tetrahymena thermophila, a ciliated protozoan. These cells have been used extensively to study the effects of factors such as environmental stresses, toxicity, evolution, and the biochemical activities of important molecules. T. thermophila are usually found in fresh water conditions in many places around the world. They have proven to be valuable for eukaryotic

cell research because they are easy to work with and do not require sophisticated equipment and facilities. T. thermophila is an ideal model to study because their cellular activities are very similar to mammalian cells.
The goal of this project was to examine the effect of oxidative stress on Sirtuins THD17 and THD Cells were exposed to 1 mM of Hydrogen peroxide, 50 mM of paraquat (PQ) or starvation for two and four hours. Following incubation, cultures were assessed for cell death and mRNA expression pattern. Our results showed more cell death in H2O2 treated cells compared to PQ and starvation. Under PQ and starvation conditions, no cell death was detected. Similarly, mRNA expression levels of Sirtuins THD17 and THD11 were upregulated under H2O2 treated and starved conditions. These results suggested THD17 and THD 11 may be involved in oxidative stress in T. thermophile.

Title: Computational Design of a Drug to Reverse the Effect of Alzheimer.

Student Researcher(s): Sofia Azizi, Najma Bibi, David Carvajal, Veronica Hurtado, and Christopher Mason
Faculty Mentor: Prof. Mai Zahran

VEGF-D, a protein part of the vascular endothelial growth factor family, is commonly known as an angiogenic mitogen. It has recently been discovered to control the total length and complexity of dendrites both in cultured hippocampal neurons and in the adult mouse hippocampus through nuclear calcium-calmodulin-dependent protein kinase IV (CaMKIV) signaling. This finding gives hope for a potential cure of neurodegenerative diseases such as Alzheimer, however, VEGF-D is too large to be able to bypass the blood-brain barrier. The goal of our work is to computationally design and test a set of small molecules that would replicate the function of VEGF-D while being able to bypass the blood-brain barrier. We have computationally designed a set of peptides based on the three-dimensional structure of VEGF-D, and are planning to analyze their properties and the strength of binding to VEGFD's receptor in the future.

Title: Tailored Protocols for DNA Extraction of Antipatharians

Student Researcher(s): Nicole Bellaflores-Mejia and Eni Sejdini
Faculty Mentor: Prof. Mercer Brugler

The order Antipatharia consist of aquatic Cnidarians referred to as Black Corals and inhabit deep ocean waters making it rather difficult to study and collect. With more than half of the total amount of determined species (185 out of 247) located in depths between 4 - 8,900 meters, collected samples, while small, yield large values. Piecing together the genetic relation and

molecular make up of these species not only allow an insight into its evolutionary history, but it can also explain possible variations from similar genus and species. With morphology not an ideal form of comparing antipatharians, scientist have turned to mitochondrial genome due to it's tendency to evolve slower than other genetic markers. It is for that reason that DNA extraction is especially important when working with small samples such as Black Coral because of the amount of effort and time invested into the collections. Below are seven steps which are necessary when isolating mitochondrial genome from DNA samples of Antipatharians.

Title: Bose-Einstein condensation and kinetics of polariton superfluid

Student Researcher(s): Willie Cheung and Oswaldo Minchala
Faculty Mentor: Prof. Oleg Berman and Prof. Ilya Grigorenko

Bose-Einstein condensation of exciton polaritons in a semiconductor microcavity was studied. These exciton polaritons are formed by excitons in a quantum well embedded in a semiconductor microcavity coupled to microcavity photons. The excitons in a quantum well interact with the electrons in a parallel quantum well filled by electrons. Assuming the electrons are moving by external electric field, exciton polaritons are dragged by the electrons. The drag coefficients describing the kinetics of the moving polariton superfluid are calculated applying Boltzmann kinetic equations. The values of these coefficients reflect the polariton superfluidity in the system under consideration.

Title: Gender Differences in Vagal Tone Adaptation in an Expressive Writing Paradigm

Student Researcher(s): Cherishe Cumma, Dana Glatzer, Daniel Rosales and Saber Ventura
Faculty Mentor: Prof. Jean Hillstrom

Research shows that writing about traumatic, stressful or emotional events is associated with improved health and well-being. We assessed the effects of a standard vs. meaning-making expressive writing format on autonomic nervous system function over time. Results indicate that heart rate and to a lesser degree, vagal tone, improved over time in both conditions but these results were moderated by gender. Men showed improvement in vagal tone for the standard but not the meaning-making condition.

Title: Obesity: Examining the Effect and Consequences

Student Researcher(s): Bora Durrsi, Devya Gurung and Nicole Madrazo
Faculty Mentor: Prof. Sanjor Chakraborty

Obesity has become an epidemic in America. About 27% of Americans are now considered obese. Obesity is a disorder caused by the accumulation of excess adipose tissue. It has a far-ranging negative effect on health including high blood cholesterol, dyslipidemia, Insulin resistance, glucose intolerance, cardiovascular disease, and some type of cancers and poor female reproductive health. The aim of this study is to analyze the effect of high fat induced obesity in mice model. The study will analyze the food consumption as well as the calorie in-take in animals. Further the histology profile examination of different organs of very high fat fed mice will be studies and will be compared to the normal diet fed mice indicating the effect of hormones on the high fat induced obesity. Since there are a limited number of studies available on mice models this study is very interesting and helps to understand the effect of high fat on body homeostasis.

Title: Optimized coarse-grained residue-level distance-dependent potentials for protein fold recognition

Student Researcher(s): Nataliya Ferdinand and Warner Alexis
Faculty Mentor: Prof. Armando Solis

Among a number of approaches to solve the protein folding problem, those based on bioinformatics have proven to be useful and effective in exploiting information found in proteins for use in structure analysis and prediction. Such approaches make use of knowledge-based potentials, mathematical formulas that summarize energies of interactions in folded proteins, routinely derived from large databases of high-resolution protein structures derived from X-ray crystallography. In this work, we are interested in investigating coarse-grained potentials, which have gained prominence for large-scale macromolecular simulations because it can effectively summarize complex many-body interactions. In particular, we seek to determine the best parameterization of a well-known non-bonded potential, the distance-dependent interactions between the beta-carbons of each amino acid pair, using a well-established information-theoretic framework. After developing the optimal potential, we intend to measure its performance using extensive fold recognition tests. This involves the identification of the correct native structure given the protein sequence amidst a vast set of decoy conformations. Based on prior work, we are confident that our coarse-grained non-bonded potential will be a useful tool for protein fold recognition and structure prediction.

Title: Better virtual alpha-carbon backbone parameterization to better represent local structure of proteins

Student Researcher(s): Samuel Isacc and Suleyman Sulley
Faculty Mentor: Prof. Armando Solis

Because the macromolecular structure of proteins is complex, it is frequently necessary to simplify structural descriptors to facilitate conformational analysis. The atomic positions of the protein backbone, an important feature of protein structure, can be described and simplified using various parameters. In this work, we examine the effectiveness of simplifying description using only the virtual trace of successive alpha carbons that mark the 3D location of the amino acids in the protein chain. This virtual alpha carbon backbone can be parameterized with a bond angle, defined by three successive alpha carbons, and with a dihedral angle, formed by the two planes that are defined by four successive alpha carbons. We intend to measure the sequence dependence of the series of bond and dihedral angles using information theory, and optimize parameters that can be used for a local backbone potential. We are interested in how the virtual alpha-carbon backbone compares to other backbone descriptions (in particular, the Ramachandran dihedral angle pair description) in the way it preserves structural information. This work can potentially introduce a more effective way of describing local structure, for use in structure refinement and prediction, and can reveal novel sequence-dependent patterns that could illuminate the protein folding code.

Title: A Journey into Lucid Dreaming

Student Researcher(s): Sheila Moaleman and Nasreen Haque
Faculty Mentor: Prof. Niloufar Haque

Lucid dreaming is a rare type of dreaming where the dreamer is able to recognize that a dream is taking place while still dreaming. This element of awareness provides the dreamer with a means to impact his or her dream. Research into lucid dreaming can provide numerous therapeutic treatments for people suffering from Post Traumatic Stress Disorder (PTSD), anxiety disorders and various other mental health conditions. In order to determine if lucid dreaming is a new state of consciousness or if it fits into one of the already recognized consciousness states, it is imperative to discuss the neurological mechanisms behind the cardinal states of consciousness: wake, non-REM sleep (NREM), and REM sleep. Once the basis of sleep has been understood, it is important to see which parts of the brain are active during lucid dreaming and whether lucid dreaming fits into any of the cardinal states of consciousness. Lucid dreaming falls into its own category; it is a hybrid of REM sleep and waking. Insight into what happens in the brain during lucid dreaming can be used to train people on using lucid dreaming as a mental exercise. About 8 million people a year have PTSD. Lucid dreaming, when used as a holistic treatment, could eventually offer sufferers a treatment plan that does not rely primarily on prescription medication. This would allow the sufferer to regain a sense of power in his or her own life

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Title: Different Aspects of Web Application

Student Researcher(s): Khadijah Okoh, Shanice Williams and Gwenneth Worthy
Faculty Mentor: Prof. Marcos Pinto

The goal of this research project is to enhance our knowledge of web design techniques, specifically pertaining to the use of media queries, JQuery and Web Application Mashups. Media query is used when adapting a web site's ability to format content to fit different screen sizes across various platforms. JQuery library is used to create animation on websites by using certain programming languages. The manipulation of media queries and JQuery in conjunction with HTML, JavaScript, CSS and Adobe Flash Player allows web developers to achieve a uniform look for content regardless of the device being used. In addition, while being able to use these web designs in web applications, they can be used to combine many sources to create another service. This allows searching the web easily and more efficient for users.

Title: The Effect of Oxidative Stress on Sirtuins in Tetrahymana thermophile

Student Researcher(s): Kabir Omolaja and Masood Usman
Faculty Mentor: Prof. Ralph Alcendor

Sirtuins are a family of proteins that exist in almost all life forms. They are involved in important processes and functions such as lifespan expansion, protection from cell death and regulation of important cellular processes. Although sirtuins have been studied extensively, little is known on their role in oxidative stress in Tetrahymena thermophila. Tetrahymena thermophila, a ciliate protozoan, has been used as a model for studying the effects of a wide range of factors and stresses. These cells are very easy to work with and they are great models for eukaryotic cells, especially human cells. One of the most popular uses of Tetrahymena is to examine the toxicity of drugs and heavy metals. Oxidative stress is the imbalance between toxic form of oxygen or reactive oxygen species, and antioxidants. High levels of oxidative stress results in cell death, and damage to proteins and nucleic acids. Oxidative stress has also been shown to be involved in diseases such as cancer and Alzheimer's disease. Although oxidative stress has been studied extensively very little is known on Tetrahymena thermophila's response to oxidative stress. Therefore, the goal of this project was to examine the effect of oxidative stress on sirtuins in T. thermophila. Cells were exposed to H2O2, ethanol and starvation for 2 to 4 hours. Following incubation, cell death and mRNA levels for selected sirtuins were assessed. Both H2O2 and ethanol caused cell death, compared to starvation. mRNA levels of two sirtuins, THD14 and THD16 were upregulated in ethanol and H2O2 treated cells. These results suggest these sirtuins may be involved in cellular activities related to oxidative stress.

Title: Math of Trash

Student Researcher(s): Rushda Rafeek, Saloua Daouki
Faculty Mentor: Prof. Nadia Kennedy and Prof. Ariane Masuda

The research project consists of designing mathematical tasks for middle school students, intended to utilize aspects of students' lived experiences and of their communities as contexts for mathematization, and to engage students in the mathematical modeling of personally meaningful situations. Additionally, the tasks aim to engage school students in exploring relationships between mathematics and important social issues, and facilitate a deeper and more nuanced understanding of mathematics and of its social dimensions that are often invisible.

Title: Investigation of Scaffold Fabrication Techniques: Tissue Engineering for Reducing Medical Waste and the Environmental Impacts

Student Researcher(s): Joyce Tam and Meleha Yousaf
Faculty Mentor: Prof. Ozlem Yasar

Ever since an infectious disease is on the rise such as Ebola, hospital infection and sanitation, especially medical waste management, have been brought to the attention in medical facilities. Medical waste needs to be carefully treated during the collection and thermal conversion processes in an effort to avoid any possible contamination and infection. To reduce the medical waste and environmental impacts, utilizing advanced tissue engineering is an alternative approach for the organ transplantation, which is costly and complicated inherently in finding/facilitating the right donor organ. Design and fabrication of scaffolds are required for tissue growth and replacement. Commonly used fabrication techniques generate the scaffolds using heat, adhesives, light or molding. These four techniques, however, has different environmental impacts in terms of toxic/non-toxic materials, energy consumption, material costs in the fabrication processes. This preliminary research showcases the right choice of materials and fabrication technique to generate the tissue scaffolds, minimize the environmental impacts.

Title: Document and Design

Student Researcher(s): Claudia Tupayachi and Hito Rodriguez
Faculty Mentor: Prof. Lia Dikigoropoulou

This project has given students an opportunity to explore and participate within a real job environment: Documenting an existing condition in a building which is located in
Carroll Gardens, a Brooklyn neighborhood, in New York City. Students have been assigned to cover four main aspects of the project:
1. Building codes verification
2. Documenting and drawing existing conditions of the residence
3. Interviewing the clients and implementing their needs;
4. Creating of alternate design schemes that meet all of the above parameters.

Initially students met with the client and went over their specific needs and the requirements for the project. They understood the client's needs and specifications of the design aspects. The client asked to recreate a "Country Style", and renovate the interior with a more open space and increase the storage capacity. In order to renovate the interior of the house, students need to explore different conceptual designs and follow the client's needs.

The "Country Style" is designed in a generally relaxed and comfortable manner with simple adornments. This décor commonly references American heritage through the use of traditional materials and a country motif. Homes are inviting, cozy, and comfortable, often with wood floors and stone or brick fireplaces. Spaces look "lived in" with the use of antique and functional decorative elements such as pottery, carved wood, hand-formed metal, and baskets. Furniture is typically made of leather or soft fabrics in muted colors with floral or gingham patterns.

The existing space has a dated kitchen and bath, with a living room and dining room. It is a 700 sq ft space that the students will reconfigure to maximize its use. New finishes are to be selected to much the client's style. New appliances will be recommended, and new furnishing will be suggested. Maximizing storage is another issue that will be address by the students.