



Book of Abstracts

The Emerging Scholars Program

Fall 2014

Supported by New York City College of Technology



Student Researchers	Dept.	Faculty Mentors	Project Title	Page
Alondra Ramos Farhana Rahman Nwaram-Billi Ugbo	ARCH	Alexander Aptekar	Exterior Development [DURA Solar Decathlon 2015]	6
Graci Rexha Redon Rexha	ARCH	Alexander Aptekar	Design Development and Materials	7
Gareth Enahoro Guranter Multan Loyra Nunez Brian Rogers Faraz Siddiqui Aura Tejada	ARCH	Jill Bouratoglou Lia Dikigoropoulou	Site Analysis	7
Elli Zigenis Ana Matthews	ARCH	Ting Chin	Global Sea Level Rising and the Impact Poverty has on the Adaptation to Climate Change	7
Dhavin Singh	BIO	Evgenia Giannopoulou	Studying the Epigenomic Landscape of Lupus Patients	8
Andrew Maloney Meredith Zwicke	BIO	Vasily Kolchenko	Using Infograms for Online Educational Videos	8
Daenna Joseph	BIO	Jeremy Seto	Quantitative PCR Analysis of Expression Changes in Differentiating PC12 Cells	8
Deannie Joseph	BIO	Jeremy Seto	Compiling a Spectral Library of Fluids Towards the Identification of Additives and Forgeries	9
James-David Brown	BIO	Jeremy Seto	Network Analysis of Gene Expression Changes in Maternal Immune Activation Model of Schizophrenia	9
Victor Adedara Natassa Gavalas Andrew Cook Natalie Nelson Erica Yeboah Malessa Yeboah Farjana Ferdousy	BIO CHEM MAT	Diana Samaroo Liana Tsenova Sandie Han Urmi Ghosh-Dastidar	Prospect Park Biodiversity Project	9
Rebecca McCurdy	CHEM	Alberto Martinez	Take a Sip: Anti-Alzheimer's Properties and Other Health Benefits of Coffee and Caffeine	10

Student Researchers	Dept.	Faculty Mentors	Project Title	Page
Matthew Henning	CHEM	Tony E Nicolas	Synthesis of a Model of the AB Ring System of the Angularly Oxygenated Angucyclines	10
Yanna Chen Megha Bhambri	CMCE	Hamidreza Norouzi	Potential of Using Microwave Emission in Global Analysis of Land Cover and Drought State	11
Nyan Lynn Oo	CMCE	Hamidreza Norouzi	Comparison of Ground-Based Soil Moisture Measurements With Satellite Data	11
Ashley Lino-Frazier	CET	Farrukh Zia	Cyber Physical System Implementation	11
Farhin Kapadia	CET	Farrukh Zia	Implementation of Cyber Physical Systems with Open Source Computer Hardware and Software	12
Preeti Gurung	CST	CheinChang (Peter) Li	Implementation of Web Hosting on Virtual Machine and Introduction to Tomcat and Glassfish Application Server and Their Comparison Inhibitor	13
Hibba Abbas	CST	Marcos Pinto	Responsive Web Design and its Applications	13
Khachatur Arutyunyan	CST	Marcos Pinto	XML Data Transfer in Android Application	13
Elvis Sanchez	CST	Marcos Pinto	Building Websites and Applications through AJAX	14
William Zhong	CST	Marcos Pinto	Mobile Dictionary	14
Shamsan Ahmed	CST	Badreddine Oudjehane	Implementing Software as a Service (SaaS) Solution Using MS Azure	15
Ina Tsikhanava	ETET	Djafar Mynbaev	Application of the Fourier Transform for Spectral Analysis in Telecommunications Engineering Technology	15
Michael Youmans	ENG	George Guida	Editorial Internship at <i>2 Bridges Review</i>	16

Student Researchers	Dept.	Faculty Mentors	Project Title	Page
Sorzahno De Souza	ENG	Caroline Hellman	Struggle and Security in Early American Literature	16
Zianne Cuff Florenca Garcia Mandy Mei Hema Puran Jodieann Stephenson	ENG	Reneta Lansiquot	Chronicling the Achievements and Activities of Honors Scholars at City Tech	17
Solanlly F. Hernandez Tykila McCray Noel Melendez Andy Persaud Walter Rada	ENG	Reneta Lansiquot Candido Cabo	Writing Case Studies for Problem Solving with Computer Programming	17
Aaron Hollander	ENG	Mark Noonan	The Publishing and Commercial History of Peck Slip	17
Alicia Ngai	HMG	Patrick O'Halloran	Hospitality Industry Certifications As It Relates To Students And Employment Opportunities	18
Blanca Cortes	HMG	Patrick O'Halloran	Cyber security	18
Jovany Bravo	HMG	Patrick O'Halloran	Video Surveillance Hospitality Industry	18
Suzanne Tran	HMG	Gerald Van Loon	The Nature of Internships in the Hospitality, Travel, and Tourism Industries: Integrative Literature Review	19
Md. Afzal Hossain	MAT	Satyanand Singh	Closed Linear Economies	19
Joe Nathan Abellard	MAT	Samar ElHitti	An Overview of Google's PageRank Algorithm	19
Steven Tipton	MAT	Boyan Kostadinov	Computing Grade Distributions by Major and Gender and Fitting a Logistic Model to a Binary Predictor	20
Rezwon Islam	MEDU	A.E. Dreyfuss	What Misconceptions Do Students Have in Solving Problems in Fundamentals of Mathematics (MAT 1175)?	20

Student Researchers	Dept.	Faculty Mentors	Project Title	Page
Ricky Santana	MEDU	A.E. Dreyfuss	Transition to College: Why Do Incoming Freshmen Not Attend a Free Summer Bridge Program?	20
Curtis Appiah	MECH & IND	Masato Nakamura	The Motion of Municipal Solid Wastes on a physical model of a Combustion Chamber	21
David Owoeye	MECH & IND	Angran Xiao	Simulation of Fluid Flow in Injection Molding Process	21
Alex Sette	MECH & IND	Ozlem Yasar	Lindenmayer System Based Scaffold Design	21
Shalman Ahmed	MECH & IND	Ozlem Yasar	Scaffold Design and Fabrication for Tissue Engineering Applications	22
Abdul Haq	NUR	Aida Egues	Analyzing Social Factors Contributing to Cardiovascular Disparities Among African-Americans	22
Emily Kheluram Anyelina Genao	NUR	Aida Egues	Mentoring Among Registered Nurses: A Literature Review	23
Ricardo Ferro Andy He Hasanuzzaman Rahman	PHYS	German Kolmakov	Propagation of Exciton Polariton Condensate Perturbations in Patterned Microcavities	23
Alicia Symister Niki Patel	RAD	Jennett Ingrassia	Radiography Students Perception of the use of Technology for Demonstration of Radiographic Positioning of the Shoulder	24
Steve Gazca	RAD	Zoya Vinokur	Tin Man	25
Keishawna Jones Shalamar Raimie Cherishe Cumma	SOC	Jean Kubeck Hillstrom Ernie Cote Pa Her	Positive Reframing and Vagal Tone: A Variation on the Expressive Writing Paradigm	25
Dennis Trotter	SOC	Sean MacDonald	Application of Place-Based Research in the Solar Decathlon Project	26
Sidra Zafar	SOC	Sean MacDonald	Economical and Environmental Benefits of Recycling	26

Title: Exterior Development [DURA Solar Decathlon 2015]

Student Researchers: Alondra Ramos, Farhana Rahman and Nwaram-Billi Ugbo

Faculty Mentor: Prof. Alexander Aptekar

Department: Architectural Technology

Problem posited by the Department of Energy: How to design and build a net-zero solar powered house that is fiscally attainable and sustainable?

This project exhibits the design of a façade, ramp and solar wall working in conjunction with structural components of a modular residence. Our focus is on these three areas as these elements are a main attraction that will invite people to our Solar house. Challenges we will encounter range from the design, to the mechanics of making an eco-friendly home and weather durable facade.

FAÇADE CONCEPT: The design concept of the façade came with the word movement. I played with the scale of the panels to give the façade a sense of rhythm. Also, for the façade to showcase part of the structural elements of the residential unit, I used linear panel shapes to pinpoint the location of each column and where the connection of the container modules occurs, and also used horizontal panel shapes to showcase the floors for a cohesive design. The material of the panels will be concrete board with a shade of red. The color was picked to mimic bricks, since NYC is known for its use.

HANDRAIL CONCEPT: The concept for the handrail is derived from the façade pattern and is intended to be somewhat rhythmic. The scale variation of each piece combined with the puzzle effect of the façade creates an intricate ramp design. The goal is to blend the façade and ramp together in order to have an aesthetically pleasing extension of the house. Both exterior parts are integrated to become one coherent system. The materials chosen for the ramp are reusable and recycled wood.

The ramp is designed to ergonomically facilitate use by handicap persons and this is achieved by decreasing ramp length and the way said ramp is connected to the house.

SOLAR WALL CONCEPT: The concept of a solar wall that intuitively tracks the motion of the sun led our design team to devise a seasonal tracking system that will be applied to the south facade of our housing module.

The solar wall was first envisioned as a bi-fold system that would in part reflect solar rays in order to amplify gained energy. That design has evolved to incorporate the use of Peltier tiles to better utilize heat energy gained and to harness it for future use within the solar house.

The design of the solar wall is ever evolving throughout the schematic phase and as such its efficiency is continually improving with each design iteration.

Solution: For the sustainable part of our design, we decided to go with green methods. For the façade, we chose concrete board for its long term performance, and its resistance to moisture. Fortifying the residence against the harsh New York City weather. For the ramp to be sustainable, we chose to use recycled wood so we can reuse and repurpose wood that would otherwise be discarded or remain unused.

Title: Design Development and Materials
Student Researchers: Graci Rexha and Redon Rexha
Faculty Mentor: Prof. Alexander Aptekar
Department: Architectural Technology

The approach to the development of a design and coordination of the decorative architecture features of the interior design. A projects schematic design is refined to include design details, and the selection of materials. The application of sustainable design principles and the adaptive use of building materials are used to incorporate our DURA home, meaning Diverse, Urban, Resilient, and Adaptable.

Title: Site Analysis
Student Researchers: Gareth Enahoro, Guranter Multan, Loyra Nunez, Brian Rogers, Faraz Siddiqui and Aura Tejada
Faculty Mentors: Profs. Jill Bouratoglou and Lia Dikigoropoulou
Department: Architectural Technology

Site Documentation: To develop drawings documenting existing conditions that serve as a basis for contextual analysis and architectural design work

Site Analysis: To develop a clear understanding of contextual forces in society and within the built environment that inform architectural and urban design strategies.

Students will analyze social patterns, behaviors, flows, and narratives specific to a site. Initially, students will graphically document site-specific characteristics and then they will document their own interpretations identified within the built environment.

Title: Global Sea Level Rising and the Impact Poverty has on the Adaptation to Climate Change
Student Researcher: Elli Zigenis and Ana Matthews
Faculty Mentor: Prof. Ting Chin
Department: Architectural Technology

The purpose of this study is to determine how developing countries with a lower standard of living, an underdeveloped industrial base and a low human development index relative to other countries are adapting to sea level rise. We found that coastal communities, specifically Dhaka, are more prepared than might be expected when it came to adapting to sea level rise and disaster preparedness. The people are more adaptable as they are mostly living in impermanent homes, and so relocating after the waters rise will affect them less than wealthier nations with more advanced infrastructure.

Three-quarters of the world's urban population and its largest cities are in coastal regions—specifically, in low and middle-income nations. The people who live in lower-income coastal areas are at the most risk due to climate change and, although their assets would not be the most affected by sea level rise, they will suffer the most due to the lack of infrastructure, finances, preparedness, and large populations.

Title: Studying the Epigenomic Landscape of Lupus Patients
Student Researcher: Dhavin Singh
Faculty Mentor: Prof. Evgenia Giannopoulou
Department: Biological Sciences

Since the completion of the Human Genome Project in 2003, a wealth of knowledge has been accumulated regarding diseases and the genes that code for them. To fully understand the complexities of the human genome, Next Generation Sequencing (NGS) technology has been employed. Here, we analyze NGS data from Reduced Representation Bisulfite Sequencing (RRBS-seq), a technology used to systematically capture the genome-wide methylation profiles on a single nucleotide level. The sequencing data comes from patients with Systemic Lupus Erythematosus (SLE), as well as from controls, and the goal of this analysis is to find differentially methylated regions in the genome and their corresponding genes.

Title: Using Infograms for Online Educational Videos
Student Researchers: Andrew Maloney and Meredith Zwicke
Faculty Mentor: Prof. Vasily Kolchenko
Department: Biological Sciences

Video and audio technologies have long been used for educational purposes, and in the internet age the quantity and variety of available content has grown exponentially. Which videos are right for your class? How are efficient videos produced? What are the cognitive foundations of their success? Our research studies the existing methodologies for creation and dissemination of educational video and audio recordings in order to better understand the qualities of effective content. Unique learning materials called Infograms, or graphic symbolic summaries, have been developed at City Tech for BIO 2311, Anatomy and Physiology I. Infograms employ key terminology, abbreviations, pictograms, simple charts, diagrams and line drawings to encode and condense information on one page. Our previous research suggests that a diverse set of approaches to subject matter are critical in the comprehension and retention of the large volume of information required for the successful study of anatomy and physiology. Infograms have the advantage of cognitive clarity and consistency. This approach to graphic representation of knowledge is of particular benefit in educational video production. We have produced audiovisual study aids combining a 'big picture' of the topic with an economy of visual expression that emphasizes conceptual connections.

Title: Quantitative PCR Analysis of Expression Changes in Differentiating PC12 Cells
Student Researcher: Daenna Joseph
Faculty Mentor: Prof. Jeremy Seto
Department: Biological Sciences

The Pheochromocytoma cell line (PC12) is derived from a tumor of the rat adrenal medulla. This de-differentiated ectodermal lineage is used as a tool in neuroscience research in order to study the effects of conditions in the neuronal-like cells upon differentiation with Nerve Growth Factor (NGF). The gene expression changes that occur with the differentiation by NGF provides a unique opportunity to understand a genetic switch in a program that balances a mitogenic

versus mitostatic outcome. This study will look at the changes during the time course of this genetic switch using quantitative Real-Time PCR.

Title: Compiling a Spectral Library of Fluids Towards the Identification of Additives and Forgeries

Student Researcher: Deannie Joseph

Faculty Mentor: Prof. Jeremy Seto

Department: Biological Sciences

Using visible and fluorescent spectrometry, a low-budget spectrometer will record the spectra of beverages and other fluids. The spectral fingerprints will be used to identify additives or contamination that may be of health concern or expose intentional corruption of products.

Title: Network Analysis of Gene Expression Changes in Maternal Immune Activation Model of Schizophrenia

Student Researcher: James-David Brown

Faculty Mentor: Prof. Jeremy Seto

Department: Biological Sciences

Maternal Immune Activation (*MIA*) is an animal model of Schizophrenia where in utero rodents are subjected to immunological stressors. *MIA* animals display a hypersensitivity to psychotropic stimuli that induce hallucinations. Cytokine panels and RNA-Seq analysis illustrate profiles of activation conserved between two models of *MIA*, influenza and stress. Biomarkers identified in these screens define a distinct alteration resulting in a latent phenotype. Utilizing the known biomarkers as a mechanism underlying neurodevelopmental, alterations can be illustrated through the use of network analysis to understand the etiology of the human disease.

Title: Prospect Park Biodiversity Project

Student Researchers: Victor Adedara¹, Natassa Gavalas², Andrew Cook², Natalie Nelson², Erica Yeboah³, Malessa Yeboah³ and Farjana Ferdousy³

Faculty Mentors: Profs. Diana Samaroo¹, Liana Tsenova², Sandie Han³ and Urmi Ghosh-Dastidar³

Departments: ¹Chemistry, ²Biological Sciences, ³Mathematics

The Prospect Park Biodiversity project is a SENCER (Science Education for New Civic Engagement and Responsibilities) collaboration project between the Departments of Chemistry, Biological Sciences and Mathematics, which aims to enhance students' participation and learning in STEM through a civically-engaged framework. The project utilized the eco-complexity of Prospect Park Lake for an interdisciplinary study of biodiversity. The goal of the microbiological research was to perform a comprehensive water quality analysis by measuring the total number of bacteria and coliforms (as indication of fecal contamination) present in water samples from five sites of the lake. The chemical analysis involved measuring the dissolved oxygen (DO), conductivity, level of nitrates and nitrites, water hardness, and pH levels of the water samples. Students performed regression analysis between bacteria including fecal

coliforms and various chemical factors. Tables, charts and graphs demonstrate the details of the results of the team's research.

Title: Take a Sip: Anti-Alzheimer's Properties and Other Health Benefits of Coffee and Caffeine

Student Researcher: Rebecca McCurdy

Faculty Mentor: Prof. Alberto Martinez

Department: Chemistry

Alzheimer's disease (AD) is the leading cause of dementia in the world, responsible for 50-75% of dementia cases in individuals over the age of 65 years. There is no cure for AD, only medications available to mitigate the symptoms. AD is a neurodegenerative disease that affects memory, language and eventually motor skills. The disease is characterized by the accumulation of β -amyloid ($A\beta$) plaques and tau protein tangles. The aggregation of plaques, through continual cleavage from amyloid protein precursor (APP), and tangles leads to neuronal death and cerebral atrophy. Caffeine has been shown to display neuroprotective properties that may reduce the accumulation of $A\beta$ by several mechanisms. The most common dietary source of caffeine is through the consumption of coffee. Coffee is one of the most popular beverages in the world and has been studied for its numerous health benefits. Studies using transgenic mice (Tg) demonstrated the ability of caffeine to prevent amnesia and improve cognitive function by reducing the amount of $A\beta$ levels in the brain. Caffeine reduces the formation of two enzymes, β - and γ -secretase, related to Ab synthesis. With the limited resources available to treat and prevent AD, the further investigation of caffeine and coffee's anti-Alzheimer's properties warrants its continued study.

Title: Synthesis of a Model of the AB Ring System of the Angularly Oxygenated Angucyclines

Student Researcher: Matthew Henning

Faculty Mentor: Prof. Tony Nicolas

Department: Chemistry

The angucyclines are a large group of natural fungal and bacterial products related to the tetracyclines that possess broad and potent biological activity. Interesting angucyclines such as aquayamycin, which exhibits anti-HIV activity, are synthetically challenging due to the presence of oxygen functionality at the AB ring junction. Successful installation of hydroxyl groups at the AB junction would pave the way for efficient synthesis. We explore a concise reconstruction of the oxygenated core of the natural products. Our synthetic approach focuses on the coupling of a suitably substituted phthalide and activated alkyne through a tandem Michael addition/Dieckmann cyclization. The synthesis of the required phthalide and alkyne components will be discussed, as well as our efforts towards the coupling.

Title: Potential of Using Microwave Emission in Global Analysis of Land Cover and Drought State

Student Researchers: Yanna Chen and Megha Bhambri

Faculty Mentor: Prof. Hamidreza Norouzi

Department: Construction Management & Civil Engineering Technology

The ability to monitor and predict the drought or rainfall in a certain location is indirectly pertinent to the global population. The purpose of this paper is to determine the potential in using microwave brightness temperature and emissivity data to monitor previous droughts and predict future ones. It is known that there is a relationship between the amount of moisture in the Earth's surface and the microwave emissivity value of that area. Using microwave radiation at various frequencies, satellites sensors such as Advanced Microwave Scanning Radiometer-Earth Observing System (AMSR-E) and Special Sensor Microwave Imager (SSM/I) have been collecting data to formulate the emissivity around the globe for the last few decades. Each satellite has gathered data at multiple frequencies and for this study; we focus on the lower frequencies because of their higher sensitivity to surface properties. These lower frequencies tend to be more valid because the signal is emitted from deeper layers in the surface. The Emissivity Microwave Polarization Difference Index (EMPDI) from this data is used and seasonal effects are eliminated by subtracting out the averages of each month. The global EMPDI values for an entire month are then placed in contrast with an independent indicator such as precipitation. Moreover, a drought severity test is performed using techniques that previously were deployed on precipitation data to investigate the potential of using microwave observations in drought monitoring, directly.

Title: Comparison of Ground-Based Soil Moisture Measurements With Satellite Data

Student Researcher: Nyan Lynn Oo

Faculty Mentor: Prof. Hamidreza Norouzi

Department: Construction Management & Civil Engineering Technology

In this project, NOAA-CREST (National Oceanic & Atmospheric Administration – Cooperative Remote Sensing and Technology) soil moisture product from ground-based observations will be compared with satellite based estimations from microwave observations. The site is important for the future validation of AMAP mission a new satellite by NASA which will be launched later this year. Comparing mathematical and ground-based remote sensing of soil moisture is beneficial to ensure the accuracy of the measurements.

Title: Cyber Physical System Implementation

Student Researcher: Ashley Lino-Frazier

Faculty Mentor: Prof. Farrukh Zia

Department: Computer Engineering Technology

In today's society, technology is the most important aspect of the 21st century. Every day there are various engineers and computer software experts that are creating new futuristic methods for the engineering world. Cyber Physical Systems (CPS) are collaborating computational elements controlling physical entities. Embedded computers and networks monitor and control the physical processes with feedback, where physical processes affect computations. The

economic and societal potential of such systems is vastly greater than what has been realized, and major investments are being made worldwide to develop the technology.

The Internet of Things (IoT) implies that it is a network of physical components accessed through the internet. The importance of the CPS and the IoT is simply due to its importance to our information which is constantly stored in various places. These systems have the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. This emerging technology has the potential to boost every industry ranging from manufacturing and architecture to transportation and healthcare.

During this research project experiment, I will explore the use of open source hardware and software technologies to implement key components of a Cyber Physical System. Specifically, I will implement the computer hardware and software components to allow the control of an output device by sending commands and data from a website on the Internet. The long term goal of this project is to inquire how this form of technology is able to advance in the future with other output devices and how much of an importance it is for the technology to be applied in different areas of life with the help of motion sensors, electrical circuits and mobile devices such as smartphones.

Title: Implementation of Cyber Physical Systems with Open Source Computer Hardware and Software

Student Researcher: Farhin Kapadia

Faculty Mentor: Prof. Farrukh Zia

Department: Computer Engineering Technology

The world of technology has been advancing at an unstoppable speed that has only been getting faster in each step every second. In this world of technology exists the world of Cyber Physical Systems (CPS) and the Internet of Things (IoT). Cyber Physical Systems are the combination of devices such as sensors, actuators, and micro-controllers which communicate with one another and users through wired and wireless networks. The Internet of Things refers to the communication that takes place among Cyber Physical Systems through the Internet. This communication can be used to monitor and control the physical environment. It helps to connect many aspects of industrial and consumer life through the use of sensor nodes and cloud services. Both are major components that are used somehow in the real world in our daily activities. When CPS and IoT are put together, projects can vary from collecting small data such as a room temperature to something as big as collecting or keeping track of our personal fitness information without having to go to the doctor.

The project, Implementation of Cyber Physical Systems, will involve making a slave node and master node circuit. The slave node will send the motion sensor data to the master node wirelessly and the master node will forward the motion sensor data to web-site on the internet and will decide an output action. Electrical circuits' knowledge gained from the classroom and laboratory will be employed in the research to assemble background information and data, and analyze the information, synthesize and make a key component of a small scale Cyber Physical System. This research will investigate open source computer hardware and software that will put into operation the basic key components of Cyber Physical Systems and Internet of Things.

Title: Implementation of Web Hosting on Virtual Machine and Introduction to Tomcat and Glassfish Application Server and Their Comparison

Student Researcher: Preeti Gurung

Faculty Mentor: Prof. CheinChang (Peter) Li

Department: Computer Systems Technology

Our research focuses on the use of virtual machine that runs on the Windows 2008 server which acts as a host. Linux and Windows 7 operating systems are installed and configured as guest operating systems. The three operating systems are bridge-networked. We then configure multiple websites hosting on Windows and Linux based operating systems, utilizing domain name service (DNS) to support web developers. In addition, we explore open source software such as WordPress, MySQL, and comparison of Tomcat and Glassfish Application Server. We screen print our comparison and explore the interoperability of portable platforms. The result of this project is to expand our knowledge in building a web infrastructure, physically and virtually on portable developmental laptop.

Title: Responsive Web Design and its Applications

Student Researcher: Hibba Abbas

Faculty Mentor: Prof. Marcos Pinto

Department: Computer Systems Technology

The use of mobile and tablet devices to surf the web is growing at an astronomical pace but unfortunately much of the web isn't optimized for those devices. Mobile and tablet devices are often constrained by display size and require a different approach to how content is laid out on screen. There is a multitude of different screen sizes across phones, tablets, desktops, game consoles, and even TVs. Screen sizes will always be changing, so it's important that the web site has to be friendly to any screen size, today or in the future.

Responsive web design is the concept of developing a website design in a manner that helps the layout automatically resize and reformat a site's content based on the size and capabilities of the device being used. For example, on a phone, users would see content shown in a single column view; a tablet might show the same content in two columns. Responsive design pages use x and y coordinates on a grid for layout and mathematical percentages for images instead of fixed-width parameters. Using percentages instead of fixed-width parameters and a grid layout creates a more fluid layout that will resize itself to fit the size of the display. Responsive web design require a large investment of time, effort, and money, since implementing it requires the front end code HTML and CSS of a site to be rebuilt from the ground up. Responsive web design is a way of predicting the future and thinking about flexibility, usability and spacing even for devices that are yet to be released.

Title: XML Data Transfer in Android Application

Student Researcher: Khachatur Arutyunyan

Faculty Mentor: Prof. Marcos Pinto

Department: Computer Systems Technology

In the project, we will see android application, which will be able to get data from internet in XML or JSON format of data. For that we can use APIs of some websites, which allows us to get

XML (JSON) message with information which we need from the website. After the program needs to parse that information, which means that the program, cuts all unnecessary lines and characters and tags like : (<book></book> # {}) etc. And finally the information can be used in a string variable, displayed in TextView or other text object.

Title: Building Websites and Applications Through AJAX
Student Researcher: Elvis Sanchez
Faculty Mentor: Prof. Marcos Pinto
Department: Computer Systems Technology

Internet nowadays is a crucial aspect to have in your life, almost as much as gas and heat. The Internet helps to send information, and get that information back to us quicker than we have ever managed to do before. Throughout the developments of the Internet, it has gone through plenty of research, development, and was experimented with different kinds of programs and compilers. The main program that most websites use for developing websites, HTML, is still going strong today. However, a problem with HTML is that it doesn't send the information back to the server fast enough; websites that alter your search settings will usually make you refresh or, in the worst case scenario, have you enter your information again. Thanks to Google, in 2005 AJAX was created to improve upon that. Originally made to let you check maps on Google without the need for the server to refresh itself to gather the information back, it helps to deliver information to the servers and back with relative ease. AJAX eventually became a useful tool in the developers' arsenal that enables them to create appealing and effective websites that will help to make the lives of users worldwide much easier.

Title: Mobile Dictionary
Student Researcher: William Zhong
Faculty Mentor: Prof. Marcos Pinto
Department: Computer Systems Technology

Mobile Dictionary is a program that shows the user to search for a term they don't know while on the go one when forgets a term and needs it on the spot. To create this program, we use both Java, which is a programming language used every day to create applications and games, and JSON, which is used to store the data.

This program first asks the user what term doors for which the user wants to search. The program then connects to the Google database. The program then searches for the term and holds the definition in a variable (container), which is then used by the program to display the term and the definition. Having a mobile dictionary on the way is perfect for those moments when you need definitions.

Title: Implementing Software as a Service (SaaS) Solution Using MS Azure
Student Researcher: Shamsan Ahmed
Faculty Mentor: Prof. Badreddine Oudjehane
Department: Computer Systems Technology

We all know that any company needs computer software to help run the business. The process of deploying the software has changed drastically with the constant change of technology; one of the most modern and effective ways is Software as a Service (SaaS) or “cloud” phenomenon. With SaaS, instead of the software installed in the customer servers, it is hosted by the SaaS provider and can be accessed through the web. Microsoft has its own version of SaaS called “RemoteApp” that allows a company to host applications for employees to access. This project will showcase how RemoteApp can function as a SaaS and host applications for employees to access through the web instead of installing them in each machine. To demonstrate this we will publish Microsoft Office 2013 from Windows Azure and access using RemoteApp client.

Title: Application of the Fourier Transform for Spectral Analysis in Telecommunications Engineering Technology
Student Researcher: Ina Tsikhanava
Faculty Mentor: Prof. Djafar Mynbaev
Department: Electrical & Telecommunications Engineering Technology

Digital signal processing, DSP, is an operation performed today in almost every electronic device. The underlying mathematics and engineering of DSP lie in spectral analysis of signals being processed. Moreover, analysis of signals in the frequency domain, inside which several difficult problems become very simple to analyze, is one of the key issues in the field of telecommunication engineering. The Fourier transform is a main mathematical tool of the spectral analysis and therefore—DSP. Manually performing mathematical manipulations needed for application of the Fourier transform usually becomes difficult and time consuming operations, whereas the engineers—the users of this tool—need to obtain the results quickly and efficiently.

The solution to this problem can be found in using MATLAB as a main computer tool for performing all the manipulations necessary for application of the Fourier transform in spectral analysis. In this project, we will investigate how to use MATLAB to perform specific tasks in spectral analysis, which would result in improving the procedures of the use of the Fourier transform for finding the spectra of both analog and digital signals

To achieve our goals, we will develop the MATLAB scripts for optimizing the specific steps in spectral analysis of various types of signals. Such development in the MATLAB’s use would allow for better performing the Fourier transforms, which eventually would facilitate the solution of specific problems in telecommunications and digital electronics.

Title: Editorial Internship at *2 Bridges Review*
Student Researcher: Michael Youmans
Faculty Mentor: Prof. George Guida
Department: English

Michael Youmans's work at *2 Bridges Review* has been both educational and rewarding. As one of the journal's three Assistant Editors, he reads and evaluates short stories from writers of diverse backgrounds and writing styles, dealing with various themes. When Youmans likes stories, he recommends them to the editorial board, who make final publication decisions. Immersing himself in these original works has enabled him to become a more proficient writer and editor. He also takes part in editorial meetings. The *2 Bridges* editorial staff consists of three established writers, Editor-in-Chief Kate Falvey, Poetry Editor George Guida, Fiction Editor Rita Ciresi, Managing Editor Stephen Soiffer, Founding Editor Monique Ferrell, and Assistant Editors Louisa Ballhaus and Kevin Julien, who bring quality and high standards to the journal. Youmans is also active in publicizing and marketing the journal. For these reasons, he can think of no better reward for a student writer than to be a part of this great publication.

Title: Struggle and Security in Early American Literature
Student Researcher: Sorzahno De Souza
Faculty Mentor: Prof. Caroline Hellman
Department: English

Insecurity or some form of hardship has been faced by many people throughout the history of the United States. In my project I examine how hardships evolved as time progressed from the 17th century to the 19th century.

I used four texts in my study: *The Prologue* by Anne Bradstreet [1678], *Sinners In The Hands of an Angry God* by Jonathan Edwards [1741], *Civil Disobedience* by Henry David Thoreau [1849], and *Narrative of the Life of Frederick Douglass, an American Slave, Witten by Himself* by Frederick Douglass [1845] to investigate various hardships of people during that time period. In Bradstreet's poem she deals with gender, mentioning that people insult her writing because she is a woman "I'm obnoxious to each passing tongue who says my hand a needle better fits". Edwards' sermon was very damning and aggressive "In his verse is threatened the vengeance of God", letting everyone know that God is vengeful and sends sinners to hell. Thoreau believes that if you do not support something that your government is doing then you should not support your government at all: "under a government which imprisons unjustly, the true place for a just man is prison". In Douglass' narrative he talks about his life as a slave where he experiences and sees terrible things "I have seen him whip a woman, causing blood to run for half an hour at a time." The analyzed texts illustrate four different kinds of insecurity in a new nation: gender, religion, government, and race. After analyzing the four texts and seeing the struggles that the authors express, we can conclude that in the 17th and 18th centuries authors dealt with religion and gender, but as we move to the 19th century those concerns remain and unjust governments and slavery become paramount concerns.

Title: Chronicling the Achievements and Activities of Honors Scholars at City Tech
Student Researchers: Zianne Cuff, Florencia Garcia, Mandy Mei, Hema Puran and Jodieann Stephenson
Faculty Mentor: Prof. Reneta Lansiquot
Department: English

Moving into the third year with a new design, *Scholars*, the Honors Scholars Program newsletter focuses on graduate studies and includes a new section, Rock Stars of Research. *Scholars* 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 have also developed our online presence, which can be accessed on OpenLab and the College's Honors Scholars Program website.

Title: Writing Case Studies for Problem Solving with Computer Programming
Student Researchers: Solanlly F. Hernandez, Tykila McCray, Noel Melendez, Andy Persaud, and Walter Rada
Faculty Mentors: Profs. Reneta Lansiquot and Candido Cabo
Department: English

We have developed five case studies to incorporate narrative elements in all sections of CST 1101 Problem Solving with Computer Programming to improve students' skills using sequencing, selection, and repetition structures in computer programming. Each student who was part of previous learning communities linking CST 1101 and ENG 1101 wrote a case study, a story that presents a realistic, complex, and contextually rich situation and involves a dilemma, conflict, or problem that one or more of the characters in the case must negotiate. These stories include "Belvedere" by Solanlly Hernandez, "The Shadow of Invisibility" by Tykila McCray, "Movement in Green" by Noel Melendez, "Mind Games" by Andy Persaud, and "Shell Sleuth" by Walter Rada. We held several meetings and focus groups, and revised the stories based on feedback. Finally, we created flowcharts of the case studies, which will be implemented in CST 1101 courses in spring 2015.

Title: The Publishing and Commercial History of Peck Slip
Student Researcher: Aaron Hollander
Faculty Mentor: Prof. Mark Noonan
Department: English

Peck Slip today is located at the Northern end of the South Street Seaport historic district, nestled between the Brooklyn Bridge and the bustling seaport proper. As its name implies, Peck Slip was not always the sleepy plaza it is today. In Colonial times it was a proper slip in a crowded sea of commerce and trade. So where do print shops and publishing fit it? Especially of newspapers (or perhaps it's really a magazine) like The Weekly Museum, which seem to be lighthearted and for entertainment? An investigation showed that Peck Slip—and the

surrounding area—was not quite how it was imagined. Rather, it was a very diverse locale of which publishing could sensibly be a part.

Title: Hospitality Industry Certifications As It Relates To Students And Employment Opportunities

Student Researcher: Alicia Ngai

Faculty Mentor: Prof. Patrick O'Halloran

Department: Hospitality Management

In a highly competitive and volatile employment market it is vital that students develop greater ownership of their employability skills to maximize the potential for a successful hospitality career. Although there is consensus amongst key stakeholders on the importance of addressing employability there remains some debate on how best this can be achieved. This paper explores hospitality industry certifications as it relates to students and employment opportunities.

Title: Cyber Security

Student Researcher: Blanca Cortes

Faculty Mentor: Prof. Patrick O'Halloran

Department: Hospitality Management

Cybersecurity has increasingly become an area of concern for policymakers. Government agencies and American businesses, including critical infrastructure are under attack on a daily basis. Numerous pieces of legislation on cybersecurity have been proposed, ranging from piecemeal approaches to comprehensive legislation packages. Issues addressed in this paper will include facilitating cyber threat information sharing; requiring baseline cybersecurity practices for critical infrastructure; creating a federal standard for data breach notification; investing in cybersecurity research and development, education, and workforce training; and updating cyber crime statutes.

Title: Video Surveillance Hospitality Industry

Student Researcher: Jovany Bravo

Faculty Mentor: Prof. Patrick O'Halloran

Department: Hospitality Management

Hotels and casinos are open to security threats from all sides - outsiders, employees, and even guests. However, a hotel or casino cluttered with dozens of cameras and locked doors is not appealing to guests, and most hospitality operators do not have the resources to keep a large security staff. The industry is at a crossroads, and major security issues are not being addressed. The focus is on peripheral issues like storage and accessibility, as opposed to core problems. This paper will explore how the industry should set about:

- Improving monitoring and investigative productivity
- Adequately addressing guest safety demands
- Providing accurate internal work force monitoring

Title: The Nature of Internships in the Hospitality, Travel, and Tourism Industries: Integrative Literature Review

Student Researcher: Suzanne Tran

Faculty Mentor: Prof. Gerald Van Loon

Department: Hospitality Management

The internship experience is an essential element of hospitality, travel and tourism curriculums. While there is broad consensus on the significance of internships and the obligation to ensure a quality learning experience, there seems to be a lack of consensus across the literature among stakeholders on the goals and expectations for internships. A representative review and interpretation of the scholarly literature on the communication of goals and expectations by and among internship stakeholders has not been done. The results of this integrative literature review make an initial attempt to fill this void in the existing knowledge. Other gaps in the internship literature and implications for a comprehensive review are discussed.

Title: Closed Linear Economies

Student Researcher: Md. Afzal Hossain

Faculty Mentor: Prof. Satyanand Singh

Department: Mathematics

Linear economics is the leading type of economics that exists now. Using simple linear algebra, we present some examples of Production adjustment model in which we find feasible and stable production schedule. Furthermore, we show examples of the "Normalized Leontief Model," where we find price vectors for different technology matrices.

Title: An Overview of Google's PageRank Algorithm

Student Researcher: Joe Nathan Abellard

Faculty Mentor: Prof. Samar ElHitti

Department: Mathematics

Upon doing a Google search, one will notice that search results are presented from most relevant/important to least relevant/important. This splendid feature is very convenient and helps users to reach results swiftly, instead of having to wade through 10s or even 100s of pages. The "magic" that makes all of this possible is Google's PageRank algorithm, which quantitatively rates the importance of each page on the web by assigning it a page score and thus placing it somewhere on the importance/relevance spectrum of a user's search. As a result of Google's eminence as a search engine, its ranking system has greatly influenced the structure and development of the web, which in turn dictates what type of data and services are accessed more frequently. For this project, we explored Google's PageRank algorithm as discussed in the paper *The \$25,000,000,000 Eigenvector, the Linear Algebra behind Google*.

Title: Computing Grade Distributions by Major and Gender and Fitting a Logistic Model to a Binary Predictor

Student Researcher: Steven Tipton

Faculty Mentor: Prof. Boyan Kostadinov

Department: Mathematics

The goal of this project is to use the open-source software R for Statistical Computing and analyze a sample of size 364 with student data containing information about major, gender, and final grades in Calculus II. We compute and visualize the grade distributions conditioned on major and gender, and we compare several grade distributions of interest. We next investigate the conditional probabilities of failing Calculus II given a gender, using a relative frequency approach, as well as by computing the contingency table. We also perform Logistic regression on the binary variables failing grade vs. gender (being the predictor), and we make the observation that the fitted Logistic model predicts the exact conditional probabilities of failing Calculus II, given a gender. We believe the reason for this is the fact that the Logistic regression is not based on the Least Squares approach but rather on the Maximum Likelihood Method. However, a precise mathematical proof of this observation is left for another student project. The grade distributions by major and gender, computed from the data, were used to support an NSF grant proposal.

Title: What Misconceptions Do Students Have in Solving Problems in Fundamentals of Mathematics (MAT 1175)?

Student Researcher: Rezwon Islam

Faculty Mentor: A.E Dreyfuss

Department: Peer-Led Team Learning Program

Knowledge of mathematics is a requirement for all majors. Sadly, the misconceptions that students have interfere with new learning. What types of misconceptions do students actually have? Professor S. Han, who taught MAT 1175 in Spring 2014, provided one set of students' quizzes and one set of test papers to be analyzed. One problem from each set, solving radical equations, was chosen. Results suggest that undeveloped conceptual learning as well as misunderstanding rules and formulas may be sources of misconceptions. Further research is suggested.

Title: Transition to College: Why Do Incoming Freshmen Not Attend a Free Summer Bridge Program?

Student Researcher: Ricky Santana

Faculty Mentor: Prof. A.E. Dreyfuss

Department: Peer-Led Team Learning Program

The purpose of this research is to look at why incoming college freshmen do not attend a free Summer Bridge Program to prepare them for college. This research draws upon surveys conducted with graduating high school seniors who were Teaching Assistant Scholars while in high school. Through qualitative research, we explore students frame of mind regarding recruitment for a free summer bridge program that has proved beneficial to those students who did attend in the past three years.

Title: The Motion of Municipal Solid Wastes on a Physical Model of a Combustion Chamber
Student Researcher: Curtis Appiah
Faculty Mentor: Prof. Masato Nakamura
Department: Mechanical Engineering Technology

Municipal solid waste (MSW) must be initially analyzed in order to define the boundaries of the particles running on the waste-to-energy combustion chamber. The heterogeneous particle behavior was characterized by the full-scale physical model of the Martin reverse acting grate. By the test done, it was found that different particle sizes result in different residence times to according to the Brazil Nut Effect (BNE).

Title: Simulation of Fluid Flow in Injection Molding Process
Student Researcher: David Owoeye
Faculty Mentor: Prof. Angran Xiao
Department: Mechanical Engineering Technology

Injection molding is a manufacturing process for producing parts by injecting material into a mold. Injection molding can be performed with many materials but is gaining popularity in plastic product manufacturing, due to the development of new plastic materials. This semester, we studied the thermal/stress distribution in a typical injection molding process. The project starts with molding the rim of an automobile and analyzing its thermal distribution by assuming that the rim is molded using plastic. Then injection molds will be designed, and the thermal/stress distribution of the rim will be used as input to initiate the analysis of the molds. The result of the project will be a detailed analysis of rim (product) and molds (tools) in the manufacturing process.

Title: Lindenmayer System Based Scaffold Design
Student Researcher: Alex Sette
Faculty Mentor: Prof. Ozlem Yasar
Department: Mechanical Engineering Technology

In the field of tissue engineering, design and fabrication of precisely and spatially patterned, highly porous scaffolds/matrixes are required to guide overall shape of tissue growth and replacement. Although Rapid Prototyping fabrication techniques have been used to fabricate the scaffolds with desired design characteristics, controlling the interior architecture of the scaffolds has been a challenge due to CAD constrains. Moreover, large thick tissue scaffolds have reportedly limited success primarily due to the inability of cells to survive deep within the scaffold. Without access to adequate nutrients, cells placed deep within the tissue construct die out, leading to non-uniform tissue regeneration. This study aims to overcome these design and fabrication limitations. In this work, research has been expanded to design and simulation of scaffolds which have inbuilt micro and nanoscale fluidic networks. In this procedure, channels serve as material delivery paths to provide oxygen and nutrients for the cells. These channels are designed and controlled with Lindenmayer Systems (L-Systems) which is an influential way to create the complex branching networks. L-Systems model realistic development of branching system construction based on the rewriting process. In this research, through the computational

modeling process, to control the thickness, length, and the position of the channels/branches, main attributes of L-studio algorithms will be characterized and effects of algorithm parameters are going to be investigated. Preliminary work showcases the applicability of L-system-based construct designs to drive scaffold fabrication systems.

Title: Scaffold Design and Fabrication for Tissue Engineering Applications

Student Researcher: Shalman Ahmed

Faculty Mentor: Prof. Ozlem Yasar

Department: Mechanical Engineering Technology

One of the principal challenges in tissue engineering, especially with the production of large tissue constructs, is the cell survivability within the scaffold. Several research laboratories have developed porous three dimensional (3D) scaffolds where oxygen and nutrients can slowly diffuse for the proper cell growth inside the scaffold. Due to the limited diffusion of oxygen and nutrients, cells placed at a certain depth (usually 3 mm) within these tissue construct do not receive adequate nutrients. Cells die at that depth of the scaffold and this lead to improper tissue regeneration. Currently, there is a necessity to design nutrient conduit networks within the tissue construct to enable cells to survive in the scaffold. In the laboratory of “SET-Scaffolds for the Engineered Tissues” at the New York City College of Technology, tissue constructs having the nutrient conduit channels were designed and fabricated with UV-photopolymerization process. Polyethylene glycol diacrylate (PEGDA) was used as a fabrication material. This work showcases the importance of design and fabrication of scaffolds for tissue engineering applications.

Title: Analyzing Social Factors Contributing to Cardiovascular Disparities Among African-Americans

Student Researcher: Abdul Haq

Faculty Mentor: Prof. Aida Egues

Department: Nursing

Healthy People 2020 cites Heart Disease and Stroke as one area in which there is a need to improve cardiovascular health and quality of life, especially among African Americans. In this study, literature from databases were examined as to the social factors contributing to cardiovascular disparities among this population. Based upon the data, racial discrimination is the most prevalent social factor contributing to chronic activation of the Hypothalamic-Pituitary-Adrenal complex (HPA) among African Americans. Findings reveal a need for Registered Nurses and other health care professionals to conduct further research and implement interventions to reduce discrimination against African-Americans.

Title: Mentoring Among Registered Nurses: A Literature Review
Student Researchers: Emily Kheluram and Anyelina Genao
Faculty Mentor: Prof. Aida Egues
Department: Nursing

Nursing has been a profession that is viewed as nurturing and that supports young nurses. However, it has been known that senior nurses “eat their young” creating a lack of student nurse socialization thus generating poor role identification. Consequently, many nurses do not understand the significance of mentorship and its part in personal and professional growth. As a continuation to our previous Emerging Scholars project, we seek to explain the many benefits of peer-to-peer mentoring among students, practicing nurses and faculty.

A search of the peer-reviewed literature was undertaken to discover the significance in nurse-to-nurse mentorship as well as the outcomes of mentorship by experienced nurses or nurse educators. Studies collected quantitatively showed that when a nurse is mentored well, he or she thrives and is able to maintain an effective level of professionalism throughout their career. The resulting data indicated that mentoring promotes empowerment and knowledge sharing by the peer mentor helping or guiding another individual/peer mentee in his or her job or career.

Further work in this area is critical for nursing education, practice, and research. Mentorship would facilitate student nurses to transition into their professional roles and aid in recruitment. Moreover, mentorship is a valuable aspect for a new graduated nurse because it would aid nurses to increase retention by reducing stress in the new workplace. Finally, mentoring development research is needed in developing mentorship programs within the nursing profession to promote successful leadership and professional development.

Title: Propagation of Exciton Polariton Condensate Perturbations in Patterned Microcavities
Student Researchers: Ricardo Ferro, Andy He and Hasanuzzaman Rahman
Faculty Mentor: Prof. German Kolmakov
Department: Physics

There is a strong need for nanoscale devices that couple charge and light. The main application lies in new information transfer technologies, optical and quantum computing, and new light sources. Our approach is in the use of polaritons in semiconductor heterostructures. Polaritons are quantum superpositions of electron-hole pairs and photons in a cavity. We utilize patterned heterostructures to computationally design polariton nanodevices that permits one to govern the polariton propagation by means of electric signals. We design the basic elements for polariton circuits that can be further used in optical and quantum computers. Specifically, through simulations based on the Gross-Pitaevskii equation for the polariton wave function, we are searching for the optimal geometries of such elements and define the range of working parameters for optimal performance.

Title: Radiography Students Perception of the use of Technology for Demonstration of Radiographic Positioning of the Shoulder

Student Researchers: Alicia Symister and Niki Patel

Faculty Mentor: Prof. Jennett Ingrassia

Department: Radiologic Technology & Medical Imaging

Over time the radiography field continues to expand in various ways from film to computed radiography and now into digital radiography. Not only has the field broadened its horizon in the use of equipment but also in educating future radiologic technologists. The use of technology has transformed the health care system on a whole and, within the educational system, technology is being used to enhance teaching techniques. With that being said, the goal of this research is to demonstrate virtual learning technique for radiography students.

Radiography students refer to *Merrill's Atlas of Radiographic Positioning and Procedures* in order to comprehend accurate positioning information along with other resources. One common obstacle within classrooms is the fact that there are various learning styles; some may be virtual, logical, aural, verbal, and physical. In order for one to understand a concept it is recommended that we utilize our learning styles to help us understand new information.

The focused body part of interest for this research is the shoulder. This particular examination was chosen because it is one of the more extensive procedures involving six views. Traditionally, this is one of the more challenging procedures for first year radiography students. In the video tutorials you will observe two of New York City College of Technology radiography students demonstrating six commonly used shoulder positioning views. The first video clip will show the AP shoulder in neutral, internal, and external positions. In the second clip will demonstrate the PA Oblique also referred to as the Scapulae Y view, followed by the AP Oblique also known as the Grashey Method. The final video will exhibit the Supero-inferior Axial Projection otherwise known as the Axillary view of the shoulder.

The present goal of this research is to introduce the video tutorial after the Shoulder Lecture in RAD 1225, Radiographic Procedures I. The current teaching and learning method involves demonstration of the procedure taught in the lecture and in the laboratory environment, followed by supervised practice by the instructor. The use of a video demonstration, to be posted on CUNY Blackboard following the lecture will enhance the laboratory class by giving students time to review prior to class and allow additional time for practice in the lab. Also, placing the video on CUNY Blackboard will give students an opportunity to go back and review the procedure. The research will include a survey to gather the feedback from the participating radiography students. The future goal is to inspire the use of video teaching within radiography programs after classroom lectures around the country.

Title: Tin Man
Student Researcher: Steve Gazca
Faculty Mentor: Prof. Zoya Vinokur
Department: Radiologic Technology & Medical Imaging

A 23 year old male patient was submitted to the hospital with a chronic pain in the distal lower extremity and was diagnosed with Genu Varum. This condition is also called bow-leggedness, bandiness, bandy-leg, and tibia vara. The medical professionals advised that surgery was essential to alleviate the chronic pain. The treatment consists of instilling the proper metal hardware in the lower extremity called a fixator. The fixator is a device that is placed on the external part of the affected limb to correct alignment of the extremity. There are both benefits and risks to this procedure such as correction of the limb and social discomfort. The patient decided to opt against the disadvantages and went through with the procedure.

Title: Positive Reframing and Vagal Tone: A Variation on the Expressive Writing Paradigm
Student Researchers: Keishawna Jones, Shalamar Raimie and Cherishe Cumma
Faculty Mentors: Profs. Jean Kubeck Hillstrom, Ernie Cote and Pa Her
Department: Social Science

Research on the effects of expressive writing consistently shows improved health and wellbeing outcomes. In Pennebaker's (1997) expressive writing paradigm, participants are instructed either to write about emotional events or neutral topics over several sessions. Those assigned to the emotional writing condition typically display physical and psychological health improvements over time compared to the control condition (Pennebaker, 1997). This study expands Pennebaker's (1997) expressive writing paradigm to include a positive reframing (meaning-making) condition. A second major difference is that our study assesses physiological responses (e.g., heart rate, vagal tone) during the experimental sessions. Twenty subjects (9 males, 10 females), ranging in age from 18 to 49 years of age, with a mean age of 26.8 years (sd = 9.04) served as participants. Subjects were randomly assigned to one of the three experimental conditions: standard writing (n=8), meaning-making (n=7), control (n=4). Subjects wrote for at least two sessions and most wrote for three sessions (n=13). A repeated measures ANOVA comparing the first to the last writing sessions within-subjects shows a trend towards greater improvement in vagal tone over time, $F(2) = 1.553$, $p = .242$. Post hoc analyses suggest that vagal tone improved for both expressive writing conditions compared to the control group with a slightly higher improvement for subjects in the meaning-making condition. No changes were found in heart rate over time, $F(2) = .059$, $p = .943$. The results of this exploratory pilot study show that expressive writing results in improved vagal tone and suggest that the effect is greater for the reframing condition.

Title: Application of Place-Based Research in the Solar Decathlon Project
Student Researcher: Dennis Trotter
Faculty Mentor: Prof. Sean MacDonald
Department: Social Science

The goal of my research and participation in the Solar Decathlon is to learn from the process of collaboration among faculty and students from different disciplines. The Solar Decathlon 2016 is a U.S. Department of Energy project involving 30 universities worldwide in a competition to design and build the most efficient passive energy home. The project at the New York City College of Technology involves an interdisciplinary collaboration among students and faculty from the architectural, mechanical, electrical and telecommunications engineering departments in the work of modeling a home that will be diverse in design, resistant to extreme weather, and resilient and adaptable for living in a high density urban environment. At the same time, I want to demonstrate how solar passive home design features can be a model for future home building and design that can serve as a stimulus for economic expansion and job creation, lead to an increase in greener home energy production and consumption, and a cleaner environment.

Through my active participation in this project I also want to illustrate how this collaboration in planning, designing and building demonstrates the unique benefits of hands-on experience, while learning from the diverse input offered by the various disciplines involved in the project.

Title: Economical and Environmental Benefits of Recycling
Student Researcher: Sidra Zafar
Faculty Mentor: Prof. Sean MacDonald
Department: Social Science

What are some measurable economical and environmental benefits of recycling?

Since the adoption of the Solid Waste Management Act in 1988, New York City has begun to reduce its cost of shipping refuse to landfills and has seen a measurable reduction in greenhouse emissions by 7 percent. According to New York State law, these currently include plastics (including bottles), metals, glass, old electronics, batteries, cardboard and wood from both household, industrial and commercial sources. Also included is organic trash (food waste) in some parts of New York City that are part of a pilot program. Since recycling has been adopted in New York City, the amount of refuse in landfills has diminished significantly, resulting in lower transport costs for local government and a lower volume of recyclables disposed of in landfills. The program has also contributed to an improved environmental quality of life, while increasing public awareness of the importance of environmental conservation.

The recycling program in New York City has led to several secondary economic benefits as well. These include the creation of new business that haul, process and broker recovered materials, promoting economic development and well-paying jobs in the recycling and (manufacturing) industries, generating more tax revenue. Further, because of the way in which most recycled materials are transported for processing, the amount of greenhouse gas emissions that contribute to climate change has been reduced.