Book of Abstracts

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Genotype Distribution in a Population
Adrian Guin Rizzo
Prof. Ariane Masuda

Genetic adaptations occur over many generations as a result of a mix of subtle, random changes in features and natural selection of the variations that are best adapted for their environment. The purpose of this study is to analyze the propagation of inherited traits in autosomal dominant and recessive inheritance in a farmers' large population of plants and an animal breeder population of animals by computing the powers of a matrix. We create a matrix with entries representing the probability of potential offspring genotypes based on all possible combinations of the parents' genotypes. Then, by the use of SageMath on the CoCalc platform, we compute the power of the matrix to estimate how inherited traits are transmitted down through the generations. When the matrix is diagonalizable, these calculations may be done more efficiently. Using the concept of limits, we are able to estimate the probability of inherited traits in the future. This approach allows us to forecast in which generation a genotype will be the only one left or when the other genotypes will vanish from the family's pedigree inheritance patterns. Finally, we are able to examine the pattern in a population and determine the frequency of the trait after each generation in the farmers' large population of plants and the animal breeder population of animals, as well as the likelihood that the trait will be passed down to the next generation.

COMD Futures Collaboratory AR Project
Adrika Hoque
Profs. Jay Van Buren, Jenna Spevack

Augmented Reality is an emerging medium for visual art and technology that superimposes a computer-generated image on a user's view of the real world. It introduces additional channels such as audio, graphics, and video through which information can pass through and thus create communication with people across the globe. AR has evolved from a science fiction concept to a tangible method of design and communication. Membit.co is a geolocative augmented reality storytelling platform co-founded by Professor Jay Van Buren. It allows users to access memories in the form of pictures or videos placed at a specific location at a later date and time. It can be equated to a time machine and has many uses, not just for consumer use but for advertisement and research. For this research project, we will be creating an interactive virtual introduction to the Communication Design Department through student interviews and work. We can utilize this new emerging technology to tell stories and create connections in an increasingly virtual world through effective design.

Augmented Reality Collaboration with Membit.Co
Adrika Hoque, Agustin Melo Galvez, Jennell Thomas
Profs. Jay Van Buren, Jenna Spevack

Augmented Reality is an emerging medium for visual art and technology that superimposes a computer-generated image over a user's view of the real world. This emerging form of communication enhances the physical world through various technological elements such as audio and visual. AR has evolved from a science fiction concept to a tangible method of design and communication. Through our research, we explored how shared experiences or memories were accessed using this new media and how it was different and distinct. We utilized the AR application Membit^{TM}, "a geolocative augmented reality (AR) storytelling platform for iOS," developed and co-founded by Professor Jay Van Buren. AR is the future of the digital experience; combining aspects of the physical and digital world opens the door for accessibility and larger scales of effective communication.

Programing the Robot Arm suitable for an Assembly Line
Agha Akram
Prof. Muhammad Ummy

The main purpose of this project is to create a functional prototype of a multilayered system that incorporates aspects of electrical, mechanical, and computer engineering technology. The main objective of the system is to be able to determine whether a light bulb is working or not. The building blocks of this system are a robotic arm that is able to slide along a rail (for added mobility), a conveyor belt, and an electromechanical device that holds and tests light bulbs. Initially, the robot arm picks up a light bulb and places it into the holder which then tests it. A photoresistor is used to detect whether the light bulb turns on; if the bulb lights up, then it works. The robot arm then places the light bulb on the conveyor belt which moves the bulb to the other end of the conveyor belt (sensors are used at either end of the conveyor belt to determine the location of the light bulb). Next, the robot arm slides along its rail into a new position, allowing it to pick up the light bulb which is now at the other end of the conveyor belt. After picking up the light bulb, the robot arm places it in one of two locations depending on if the light bulb works or not. Digital and analog control circuits are used in conjunction with sensors to detect measurements which are then fed into a CPU as data.

COMD Futures Collaboratory AR Project
Agustin Melo Galvez
Profs. Jay Van Buren, Jenna Spevack

Augmented Reality, also known as AR, is the technology of the future that can revolutionize how we view the world. AR has many technological advances that can embed data within reality,

preserving it in different formats. These formats can vary from still images to highly developed videos containing audio or short animations. Professor Jay Van Buren is the CEO of Membit.co and has developed a platform where stories can be stored and shared. This platform can be seen as a time capsule because it allows us to store memories of events and happy occasions in our life so that later future generations can look back at how we lived. This platform can also promote and advertise art and business by providing something more engaging to the consumer/customer. For the project, we are tasked with helping to develop documentation of the COMD department and its students' work. This is for preservation and allows to document those who learned and created art in the COMD department.

Robotic Manipulation: A Practical Application of Linear Algebra in Perception and Path Planning
Akhil Sankar
Prof. Ariane Masuda

In this project we describe the mathematics that informs the decision making of a 3-degree-of-freedom robotic manipulator by performing a simple pick-and-place operation within a controlled workspace. The implementation of transformations on the coordinate reference frames in the perception step of the control loop allows the controller to infer the location of the target object within the workspace. Additionally, it describes the use of inverse kinematics and proportional control to facilitate the actuation step of the control loop, used to set the joint angles of the revolute and linear joints, respectively, to navigate the span of the workspace. The intent behind this project is to showcase a practical implementation of concepts within linear algebra, differential equations and trigonometry as the basis of this type of robotic control algorithm, allowing the reader to build a more intuitive understanding of these disciplines.

Forensic Analysis of Local HIV Isolates
Alexandra Rogers
Prof. Jeremy Seto

HIV-1 is a rapidly evolving virus that is subject to great genomic diversity. A forensic analysis was conducted on locally obtained HIV-1 reverse transcriptase sequences. Viral sequences of infected patients in the states of New York and New Jersey were obtained from NCBI Virus, aligned, and constructed into phylogenetic trees (2001-2004). An outgroup ancestral sequence was aligned with them as a reference. A sequence from a historical criminal case (1998) was aligned with the local sequences. From a historic perspective, a forensic criminal case involving a gastroenterologist who injected a former girlfriend with HIV-1 marked the first instance of using these data as evidence to track the evolution and divergence of the sequences. These analyses illustrate geographic and temporal differences in prevalent HIV strains. The variation of the reverse transcriptase sequences exhibits a viral life cycle comparably longer to other rapidly evolving viruses. The immune evasiveness of HIV enables a longer life-cycle and fewer active

replication cycles while seasonal and acute infections that actively trigger immune responses must replicate at higher rates to spread. These higher rates of replication result in greater diversification into new strains.

Learning to Innovate Websites and Apps Through Knowledge and Understanding of How the Internet Works
Ali Abbas, Bilal Badar
Prof. Daniel Wong

Our squad is largely concerned with the student life component of the city tech. design website. Our primary purpose is to promote the City Tech communication design department to potential new students and encourage them to enroll in this City Tech department. Other uses for the site include showcasing student work, showcasing graduate accomplishments, and sharing event dates with current City Tech students for activities such as club meetings, lecture series, and exhibitions. The major goal of the student advisement website is to keep enrolled students informed about upcoming events and activities within the Department. Also, for Faculty office hours, registration advice, and other student-required inquiries. The faculty communications website will primarily be used to communicate with and inform the 70+ full-time and part-time faculty about the COMD program. Only this portion of the site will show or discuss deadlines for various activities expected of teachers during the academic year, as well as modifications to programs.

Characterization of Fe(II)/Fe(III) Cycling due to Thermo-mechanical Stress in Carbohydrate Model Systems: Low vs High Field MR Feasibility Testing
Analia Basilicata
Profs. Subhendra Sarkar, Lazar Fleysher

Environmental pollutants (exogenous micro-contaminants) have significant impact on ecological and human health. There exist no imaging tools to directly visualize the transformation reactions or products generated in the host tissue affected by such exogenous micro-contaminants. Our research team is using magnetic resonance imaging (MRI), particularly the high degree of sensitivity of MR signal to the presence and chemical states of iron, manganese and several lanthanides to detect and characterize at the atomic and molecular scale the metal-metal or metal-chelator interactions in biologically active model host tissues that are rich in various minerals. MRI experiments involving those minerals seem to provide insights about various macromolecules (proteins and carbohydrates) that depend on endogenous metal ions and hydrating water to maintain biologically viable macromolecular structure and functions.

Using both low and high fields (1.5T and 3T) we observed that such exogenous/endogenous interacting species modify the paramagnetic properties locally within the samples that not only affect the sample images but also alter the image noise. While the resulting MR signal change has been extensively studied in literature the later effects involving the image noise have not been adequately explored.

High-field MR Microscopy of Paramagnetic Biometals in Heat-shocked Phantoms
Anam Riaz
Profs. Subhendra Sarkar, Duke Shereen

Paramagnetic susceptibility can affect MR imaging, particularly at high field magnets. This is the basis of susceptibility-weighted MR imaging of microbleeds in brain trauma as well as in paramagnetic contrast spread in vascular tumors. Our laboratory is working with various mineral-rich phantoms prepared from fresh fruits that undergo redox reactions depending upon their bulk pH environments and external stressors. Heat shocks allow starch polymerization and alter iron and manganese homeostasis. Browning of freshly cut apples is an example of changes in oxidation states during disturbed iron homeostasis. In this project we studied potential changes in chemical species at the stressor sites from changes in proton MR relaxation times and associated MR images.

Relational and Non-Relational Database Technologies
Brandon Alulema
Prof. Elizabeth Milonas

The use of relational databases such as Oracle provides time tested solid integrity and consistency. However, in recent years data has grown as a result of the Big Data revolution. More data has been created in the last two years than in the entire history of databases. This shear volume cannot be effectively managed by traditional relational database systems. Non-relational databases or NoSQL (Not Only SQL) database have been developed to manage Big Data. The purpose of this project is to compare and contrast the use of these relational and non-relational database systems through the use of tools such as Oracle, MongoDB and Neo4j. Through the use of these tools, we can understand why users utilize each of these systems, what are the different uses for each of these systems and what are the benefits of using these systems.

Investigating Project Success Factors in Post Disaster Rebuilding Efforts in NYC
Calvin Walters Jr.
Prof. Anne Sowder

On October 29, 2012, Superstorm Sandy caused nearly $19 billion in damages in New York City including damage to 69,000 residential units. A precipitated amount of roughly $4.2 billion in Community Development Block Grant was allocated towards Post-Disaster Rebuilding (PDR) construction. These funds addressed a range of needs, including rebuilding and rehabilitating housing, assisting displaced tenants, and providing aid to businesses. PDR is similar to construction in the modification of an existing facility that involves either renovation, additions, or subtractions to scopes of work to assist the overall performance of the facility. However, PDR goes further in a highly coordinated process involving planning for future disaster events,

integrating a temporary facility plan for those displaced, and tackling housing issues for all those affected by natural disasters. One of these projects was the Living Breakwater in Staten Island, NY, which consisted of a resiliency approach to facilitate risk reduction through erosion prevention, wave energy attenuation, and enhancement of ecosystems and social resiliency One of these projects was the Living Breakwater in Staten Island, NY, which consisted of a resiliency approach to facilitate risk reduction through erosion prevention, wave energy attenuation, and enhancement of ecosystems and social resiliency to improve resistance to storms for the community of Tottenville, Staten Island. Birthed in June 2014 by the U.S. Department of Housing and Urban Development (HUD), which launched Rebuild by Design (RBD), a contest responding to the devastation enacted by Superstorm Sandy in the northeast, the contest promoted a design-led method to create a strategy for durable sustainability and climate change adaptation. Budgeted at $107 million with $60 million coming from the federal government, the entire project is overseen by the Governor's Office of Storm Recovery (GOSR) with the primary contractor being Weeks Marine, a marine construction company established in Cranford, New Jersey.

There is publicly available information related to timing and procurement of the project including the shoreline restoration phase, scheduled construction around the migration patterns of certain marine life, and the specific times in the day when construction is allowed. The research methodology includes reviewing, compiling, and using the available information to create a conceptual project budget and schedule. The schedule will be created using Oracle's Primavera P6 Professional scheduling software and the budget will be created using Microsoft Office's Excel software. This project builds on the review of literature and project success factor analysis conducted "**Investigating Project Success Factors in Post-Disaster Rebuilding Efforts in NYC,"** research conducted in the fall 2021 as part of the Emerging Scholars Program.

Using DNA Technology to Identify Insects Found in the Courtyard
Chukwuebuka Amaefule Gregory
Prof. Jeremy Seto

DNA Barcoding procedure was used to identify different species of unknown insects.
This technique of sequencing a short fragment of mitochondrial (COI) gene, from an unknown specimen and performing comparisons with a reference library of barcodes of known species origin to establish identification of each specie collected. DNA barcoding solely can't help in the accurate identification and description of a species. Therefore, the Integration of DNA barcoding and morphological and ecological studies will help in achieving accurate identification and description of a species.

Computational Design of Electro-optical Converters for Quantum Computers
Daneilla McEwan, Dante James
Prof. German Kolmakov

Initially, our task is to model the phenomena as close as possible and be able to change various parameters and see the resulting distribution of the charge carriers after time t, as well as the

intensity of the photons given off when the two charge densities combine from opposite directions, east and west as it seems, on this solid-state device.

We are designing and researching the design of a Quantum interconnect device, which must operate remarkably close to absolute zero currently. The final model should reflect the interactions of electric fields, charge carriers and photon interactions.

This consist of researching the various solutions of various diffusion equations with various boundary conditions. This leads us to the numerical methods and a confirmation of the numerical methods by analytical methods. The analytic solution for comparison that was originally chosen was a Fourier Series solution, which was the result of using the separation of variable method for solving the second order PDE. We were able to represent the initial condition that reflected the state of the semiconductor system that we are looking at, but the solution is of an overly complex error function form. We subsequently chose a convolution integral as the analytic solution and it is quite sufficient to use this solution as a comparison to the data point(s) "solutions" of the Crank-Nicolson method. Our task after comparing the analytical to the discrete point solution is to be able to tweak the Matlab or Python code to our current needs of the Langevin Equation.

Computational Characterization of Calpains in T.thermophila
Derbie Desir
Prof. Ralph Alcendor

Calpains are a family of ubiquitously expressed calcium-dependent, non-lysosomal cysteine proteases. Calpains are involved in apoptosis, cellular proliferation, and cell motility. While mostly calcium-dependent, calpains may also be activated through ERK-mediated phosphorylation. Calpains are found in a few bacteria and almost all eukaryotes, but not found in archaebacteria. There are 15 calpains in humans. These are classified as classical, if they have a PEF domain, and non-classical if they do not. *Tetrahymena thermophila* is a ciliate found in fresh water. Remarkably, these cells have two nuclei, one is the germline nucleus and the other is the somatic nucleus. The germline, the micronucleus, is silent during vegetative growth, while the macronucleus is very active during vegetative growth. Conserved eukaryotic mechanisms have been modified in ciliates to selectively deal with the two genomes. *T. thermophila* has been used as a model to study many cellular processes. However, the role of calpains in these cells is yet to be examined. The purpose of this project was to characterize ***TTHERM_00486970***, a calpain family member from *T. thermophila,* using bioinformatics tools. Multiple sequence alignment was performed using MUSCLE (MUltiple Sequence Comparison by Log- Expectation), T-Coffee (Tree-based consistency objective function for alignment evaluation) and NCBI BLASTp (Basic Local Alignment Search Tool). Phylogenetic analysis was done using Phylogeny.Fr, MAFFT (Multiple Alignment using Fast Fourier Transform), and MEGA. Results from these tools suggest THERM 00486970 is more similar to human calpain 7. To examine this relationship further, protein models were created with SWISS-MODEL and PHYRE2 (Protein Homology/Analogy Recognition Engine) and compared using VMD (Visual Molecular Dynamics). After comparing models of TTHERM_00486970 with models of human calpain 7, 10, and 15, both Q_H and RMSD (root-mean-square deviation), confirmed TTHERM_00486970 to be more similar to calpain 7.

LGBTQ Youth Substance Use during COVID-19 Pandemic
Dillon Seebalack
Prof. Smita Dewan

The LGBTQ community has historically experienced substance use problems at a higher rate than their non-LGBTQ peers. This cross-sectional research study aims to examine patterns of substance use among a sample of LGBTQ youth between the ages of 18-25 years during the COVID pandemic. Research participants will be recruited from formal and informal LGBTQ networks through snowball sampling. Substance use trends are examined in three phases- Pre-COVID, COVID phase-1 and COVID phase-2. Participants complete an electronic survey created in Qualtrics to self-report on the use of substances during these three phases and identify a series of COVID related economic and social stressors that affected them during the pandemic. The survey will be anonymous and no identifying information will be collected from the participants. Data will be analyzed to examine if there is a relationship between the stressors and changes in the patterns of substance use. Implications for human services professionals will discussed.

How Has Covid-19 Impacted Dental Hygienist and other Dental Practitioners
Dosyleny Arias, Nathaly Rojas
Prof. Susan Davide

This is a continuum of our investigation to understand how dentistry has been impacted by this highly infectious and transmissible virus. The pandemic caused a shutdown of many dental practices due to the lockdown mandates and limited to emergency-only treatment. Additionally, aerosol generating procedures were ceased and avoided for several months. Limited routine and preventive care were almost non-existent, resulting in increased risk for oral diseases including caries, gingivitis and periodontitis. Findings from part one concluded the rate of infection from Covid-19 among dental hygienists was low because of years of proper use of Personal Protective Equipment (PPE). Dental students were affected by their educational experiences, both online learning and clinical training. Part two furthered the investigation by conducting a survey to practicing dental hygienists, other dental professionals, dental hygiene students, and restorative dentistry students to gain their experience and input during the Covid-19 pandemic. Findings supported minimal to no contraction of Covid-19 while working in dentistry, despite many unemployed or not working due to closures, use of PPE at all times, and several students were able to continue and learn effectively during the pandemic.

Radiology Technologist: More Than a Button Pusher
Erika Perez, Walquiria V Acosta Ovalle, Isra Aly, Sarahjireh Estrada, Nino Jvarishvili, Jennifer Yu
Prof. Lillian Amaan

Our research project is to collect data on the pre-existing knowledge the public has on what it means to be a radiologic technologist, as well as to inform the public about the determination and diligence it takes to be a technologist in the radiologic field. There are often misconceptions of being considered as "technicians" who only "press a button all day long"; when in fact it is much more than that. The importance of this research is to open the perception of radiologic technologists and illustrate the actual knowledge and work it requires to be in this career field. Data was collected through SurveyMonkey and posted on various social media platforms to reach the audience; we had a total of 100 participants. From the results, it was revealed that the majority of the participants didn't know how much more knowledge, besides the anatomy, is required for a 'Radiologic Technologist'. Therefore, it would be wise to spread more information about this profession, so the public knows who they are, what they do and most of all that these rad techs were one of the many frontline workers during the hardest time in the world- the pandemic!

Code Cyber: A Curated Collection of Cyber Security Sources
Ethan Pruzhansky, Jason Lin, Mohammed Zaman, Tanvir Rahman, Kazi Tasin
Prof. Patrick Slattery

We have created a website to educate the public about the five topics of cybersecurity, using the NIST standard, which identifies, protects, detects, responds, and recovers. By teaching the public about these five key points, they will understand how the industry works to protect their devices against cyber-attacks and viruses.

In our previous project, we investigated the identity function, which aids in developing an organizational understanding of managing cybersecurity risk to systems, people, assets, data, and capabilities. Through understanding the business context, the resources that support critical functions, and the related cybersecurity risks, an organization can focus and prioritize its efforts in a manner consistent with its risk management strategy and business needs. We looked into how companies recover stolen or lost data from cyber-attacks to ensure normal operation. We expanded our research on these topics by going more in-depth and have identified some ways that cyberattacks can attack your machine. By adding this information to our website, we have given a visual representation of our research.

Our objective with this website is to educate the public about cybersecurity. If someone has a question regarding cybersecurity and would like to have it answered, our website is the place to go. This would be valuable for people because the majority of cyber security websites are focused on selling their services, so they will provide their biased information to try to sell it to you. whereas our website's primary goal is to educate people about cybersecurity in-depth and give the straight facts. We believe this website will be very beneficial in the future for people who are planning to start their career in the cybersecurity industry or people who just want to educate themselves on what cybersecurity is.

Characterize a Calpain of Choice from Tetrahymena Thermophila using Bioinformatics Tools
Eva Tse
Prof. Ralph Alcendor

Tetrahymena Thermophila is a unicellular ciliated Protozoan. It is commonly found in many freshwater habitats globally. *T. thermophila* has two nuclei, a macronucleus and a micronucleus. The macronucleus is the vegetative nucleus involved in gene expression while the micronucleus is the germline nucleus involved in sexual reproduction. These cells serve as model organisms for the discoveries and the broadening of information on many biological processes such as cell division, evolution, histone acetylation and DNA elimination. Calpains are calcium-dependent, non-lysosomal cysteine proteases that are prevalent among eukaryotes and bacteria. In the human genome, there are 15 calpain genes that convert into a calpain like proteases. Of the 15 calpain genes, there are nine that are classical calpains and there are six that are nonclassical calpain. Classical calpains have a PEF domain, while non-classical calpains do not have this domain. Studies have shown that calpains are involved with programmed cell death, cell motility, and cell proliferation. Other studies suggest that uncontrolled regulation of calpains may be linked to various diseases such as, Alzheimer's disease, retinal cellular dysfunction, and many others. *T. thermophila* has about 27 calpains, however, very little is known about these calpains in *T. thermophila*. Therefore, the goal of this research project was to characterize TTHERM_01108610, one of *T. thermophila* calpain family members, using bioinformatic tools. NCBI Basic Local Alignment Tool (BLASTp), Multiple Sequence Comparison by Log- Expectation (MUSCLE), Tree-Based Consistency Objective Function for Alignment Evaluation (T-COFFEE), and Multiple Alignment using Fast Fourier Transform (MAFFT) were used for multiple sequence alignment. Phylogenetic trees were drawn by Molecular Evolutionary Genetics Analysis (MEGA). Results from these alignments and phylogenetic tree analyses suggest TTHERM_01108610 may be more closely related to human calpain 7. Further analysis is required to confirm this similarity.

Child Detection System For Preventing Hot-Car Death
Fahmeda Khanom, Touheda Khanom
Prof. Xiaohai Li

According to the Safety Organization Kids and Cars, an average of 38 children die each year from hot cars due to a lack of attention from parents. The existing alert system uses sensors that detect child presence and care less about detecting temperature inside the car. In order to save children from heatstroke, our research focuses on providing information about the temperature inside the car using very effective sensors with high precision. In our research, we have tested different sensors and figured out three sensors that can provide precise information about the presence of a child without an adult. Our child detection system uses a weight sensor, PIR sensor, and temperature sensor. The weight sensor under the child and adult seat will determine the information about the child's presence without an adult, and also PIR sensor will be turned on to confirm one more time the presence of a child, and then the temperature sensor will read the information about the temperature inside the car. Moreover, our prototype will focus on sending

text information to child caregivers about the temperature inside the car using API such as IFTTT and Twilio. The main aim of our research is to develop a child detection prototype that will determine the presence of a child left alone inside a hot car with precise information and will send alert notifications to child caregivers using different APIs. Our future work will focus on detecting the location of the child inside the car using a GPS module.

The Brooklyn-New Jersey Freight Tunnel: An Alternative to Truck Distribution
Farai Matangira
Prof. Michael Duddy

The New York Metropolitan area uses an extensive freight system that continues to support the largest consumer market in the United States. With a demanding population of over 20 million residents coupled with the growth in E-commerce, there has been a growing dependence on heavy-duty trucks for regional and local deliveries, which has put pressure on neighborhoods and the existing freight system.

To address these challenges, the city needs to transform how freight enters New York City by investing in existing infrastructure and exploring more efficient and environmentally friendly freight distribution systems. The Brooklyn-New Jersey Tunnel, a proposed freight connection between distribution centers across the Hudson River, has been regarded as a potential solution to freeing local streets from heavy-duty trucks, which creates the opportunity for vibrant, pedestrian friendly neighborhoods.

Refugees in the World
Fatima Malik, Rayen Osorio
Prof. Mukadder Cinar

Refugees are people who have been forced to leave their country for various reasons like escaping from war, political conflict, violence, natural disaster, poverty, or persecution for reasons of race, religion, or association with a particular group. According to the United Nations, around 84 million people were forcibly displaced by 2021.
In this project, we investigated the origin of displacements, the reasons of displacements, and the hosting countries of refugees by analyzing data which is obtained from the United Nations of High Commissioner for Refugees (UNHCR). The source of the most refugees at the moment is Syria with 6.7 million refugees who had fled their homes. The country who is hosting the most refugees is Turkey, 3.7 million refugees have taken shelter in Turkey.

Biometal Distribution and Diffusion: Contrast Resolution by Low kV Mammography versus High Spatial Resolution by Computed Tomography

Guito Charles, Robert O'Brien, and Areeba Masroor
Profs. Zoya Vinokur, Subhendra Sarkar, Teri-Ann Hawley

Low energy X-rays from a mammographic system were used to capture small differences in inherent tissue contrast in two-dimensional images of cut samples of select fruit and vegetable models avoiding excessive volume averaging. High spatial resolution CT images were also acquired of whole fruits to avoid volume averaging to help detect low tissue contrast. A limitation of CT imaging is the high kVp unavoidable in CT that lowers tissue contrast while the advantages are that of non-invasive 3D visualization. Using these two approaches that are very different in physical principles it is not known if either one could display possible displacement or diffusion of endogenous minerals in fresh fruits during thermal stress from heat shocks and during interaction with exogenous radiological contrast media. This project will compare benefits of high spatial resolution in CT with high contrast details present in Mammography.

ARCscholars

Habiba Abdelgawad, Shun Ebihara, Tylee Rivera, Scarlett Morales , and Jeanpaul Montano
Prof. Naomi Langer-Voss

Who are we?

We are a diverse group of scholars ranging in age, gender, and background from all over New York City. We share a common interest in solving our urban challenges through studying and proposing improvements to the built environment. From professors at CUNY CITY TECH to NYCHA Design & Implementation specialists and NYCHA residents, we encompass a group of scholars united by this common purpose.

What are we here to accomplish?

This team of ARCscholars is working collaboratively, sharing lived experiences, creatively thinking & planning and applying our research discoveries to the proposed design interventions. We seek to address and combat critical issues to foster a measurable improvement in community health, understanding, and relationships. Through enhancing the community at large via housing equity and durability and beauty, we hope that the proposed design improvements will have a direct, indirect, and long-lasting positive effects on the NYCHA communities.

How are we doing it?

We have developed an architectural and urban proposal that will enhance the overall quality and design of our case study development: the NYCHA Wagner Houses in Manhattan. Our research included a comprehensive site investigation, multiple informative discussions with the Resident Leaders at the development, and an understanding of planning issues. We met weekly to analyze, discuss, and investigate architectural and urban concepts, and develop specific planning

interventions. We also me in person twice to workshop ideas and establish close personal connections. Personal anecdotes from our NYCHA resident students helped inform the design strategy.

What have we found?

Our research informed us that our proposal should address the overall campus in addition to providing specific design interventions. The students were divided into three groups, based on their interests, and focused on three main categories of development: an overall site strategy, a reimagining of the senior center and a redesign of the youth center.

Site plan:

The site strategy team studied five basic elements of a city identified by Kevin Lynch. These five qualities; paths, edges, districts, nodes, and landmarks are used to define how people experience a city or a neighborhood. Through these qualities, the urban areas become characterized and an opportunity for growth become visible. Through site visits and observations, we deciphered what was missing and could be added enhance the development. We believe that these additions will help shape the community and be a greater connection to the city.

Senior Center:

We learned that there is a large senior population at Wagner Houses and chose to focus on the design and improvement of the Senior Center. The existing Senior Center has no seating areas or equipment to enjoy. The space in front of the building is a large concrete plaza that is used as a parking lot. As a group we chose to develop both the interior entry space in the building and the surrounding landscape and plaza. The current entryway will be converted into a multipurpose room enclosed by glass. There will be a deck added to the sides and accessible ramps placed within a new colorful landscape. In addition, the entry plaza will be developed to include seating, landscape, and catenary lights. The new interior spaces, new deck and ramps, additional lights, color, and access to the gardens will unify the space and provide a safe, appealing set of spaces for the senior population.

Youth Center:

Throughout the process of improving the youth center we began discussing what were the key elements that we wanted to incorporate and how to make it more welcoming to the community. We wanted to enhance the use of the youth center by creating a tutoring center/ preschool as well as a café with a second level that would serve to the basketball court later. The tutoring center would benefit those who live in the area. The café would also work as a food distribution center. We hope that both the café and the tutoring center would be economically affordable for those who need resources.

An analysis of Non-comparison Based Sorting Algorithms
Jacob Gomez
Prof. Brad Isaacson

Sorting algorithms put elements of a list into an order (e.g., numerical, alphabetical). Sorting is an important problem because a nontrivial percentage of all computing resources are devoted to sorting all kinds of lists. For our project, we implemented two non-comparison-based sorting algorithms from pseudocode and compared them to various comparison-based sorting algorithms. The two algorithms have their advantages and disadvantages as well as their unique features. We found that Radix Sort (which is a modified version of Counting Sort) was the most efficient of them all.

Smart Physics
Jake Postiglione
Prof. Giovanni Ossola

As our society continues to venture into a newfound age of technology, educators must continuously adapt to the ever-changing lens through which students learn. Due to the COVID-19 pandemic the need for such a paradigm shift has been made abundantly clear. The Smart Physics project aims to provide educators and students new ways of investigating the physical world through common sensors built into almost every smart device. These investigations can be performed in both traditional classroom settings and in asynchronous online courses. We analyze the way in which our team has gone from "board to screen" and follow the process of developing an investigation that can be conducted by students in introductory physics courses. Specifically, we look at the development of an investigation measuring the time intervals between the bounces of an object using an acoustic stopwatch in order to measure the energy lost through a series of inelastic collisions.

COMD Futures Collaboratory AR Project
Jennell Thomas
Prof. Jay Van Buren, Jenna Spevack

Augmented Reality or AR is a virtual platform that allows us to communicate, share and visualize information digitally through a camera-equipped smartphone or tablet. This emerging form of communication enhances the physical world through various technological elements such as audio and visual. Through our research, we explored how shared experiences or memories were accessed using this new media and how it was different and distinct. We utilized the AR application Membit[TM], "a geolocative augmented reality (AR) storytelling platform for iOS," developed and co-founded by Professor Jay Van Buren. Apps like this can effectively create and share individual and public memories for all to engage with. AR is the future of the digital experience; combining aspects of the physical and digital world opens the door for accessibility and larger scales of effective communication.

Radiologic Technologists: More Than a Button Pusher
Jennifer Yu
Prof. Lillian Amann

The profession of a radiologic technologist requires much more than simply capturing radiographs of bones. Radiologic technologists utilize their skills and knowledge to provide quality diagnostic x-rays while minimizing the dose of harmful radiation to the patient as low as reasonably achievable. The purpose of this research is to determine the public's knowledge of what a radiologic technologist is, what they really do, and to raise awareness of the career field for those who are uninformed.

An online survey was conducted to measure the public's existing knowledge of radiologic technologists. Some questions included were; the level of education of a radiologic technologist, job title (technologist vs. technician), and basic educational course work. The results revealed that roughly 90% of individuals have had experience with x-rays although only 16% knew the correct title for a professional who takes x-rays. The data also revealed that 11% agreed that technologists are just button pushers, 11% of individuals agreed that the job of a radiologic technologist is easy and 35% remained neutral.

X-rays are the eyes of medicine, yet the field is often overlooked and overshadowed by the other widely recognized healthcare professions. Especially after the COVID-19 pandemic, it poses the question, "Who are considered frontline healthcare workers?". This profession plays a vital part of medicine and requires more effort than a push of a button. It takes strength, critical thinking and problem-solving skills, a combination of physics, pathology, and anatomy to get an optimal image and save the patient from unnecessary radiation exposure. This research can help gain new perspectives or shine new light onto a field that is so often kept in the dark. It is hard work and deserves as much recognition and credit as other healthcare professions.

Pain Communication or Absence Thereof in Diseased White Matter Tracts in Neurodegenerative
Jennifer Padilla, Maleeha Sheikh
Prof. Subhendra Sarkar

Understanding pain communication of neurodegenerative diseases of the brain is the major focus in this initiative. However, pain communication requires a critical pattern analysis in neurodegenerative brains due to tissue composition differences among patients leading to significant to predict and monitor time course of neurodegenerative progression. The work here aims to identify patterns of cellular diffusion abnormality in cerebral white matter where key areas suffer from atrophy and poor white matter connectivity. The areas of interest for this study involves the frontal cortex, occipital cortex, parietal cortex, temporal cortex, cerebellum, hippocampus, thalamus, basal ganglia, mesencephalon, pons, and corpus callosum. Alzheimer's

Disease has an accumulation of beta-amyloid plaques and neurofibrillary tangles composed of tau amyloid fibrils associated with synapse loss and neurodegeneration leading to memory loss and other neurodegenerative anomalies.

Art and Mathematics Meet the Edge of Chaos
Katie Salas and Julia Burnside
Prof. Satyanand Singh

We will investigate iterative mappings in the complex plane, study orbits and create fractals. Fractals are objects which are self-similar and infinitely replicating. Some of this work trace its origins to the 1800's but became useful and important in modern studies as computers became more advanced. Some special sets that will be examined are Julia and Mandelbrot. We will use computer simulations, theoretical considerations, and complex analysis to better understand and extend work on the special sets. We will also discuss practical applications of our work. Our research will culminate with a study of the underlying chaos that is present in these systems and touch upon chaotic dynamical systems.

Studying Connectance and Robustness of Criminal Networks
Julia Burnside, Beck Bao, Raihan Bhuiyan, Julia Burnside, Aneeza Hussain, Katie Salas, Simon Zhang
Prof. Urmi Ghosh-Dastidar

Criminal networks and particularly drug trafficking networks (DTN) are different from social networks. In this work we analyzed various DTNs based on the communication strength among the actors (drug traffickers). A DTN can be represented by directed graphs (digraphs) through direct or indirect connections - a directed arc points from the exchange initiator (money, phone call, email, money laundering) to the receiver. Comprehensive analyses of DTNs are important to understand the dynamics of various such networks. We calculated several graph characteristics such as densities, clustering coefficients, and various other centrality measures for few such networks. This work can assist us in evaluating which actors or players are more connected to each other. Identifying the key players, strategists, lieutenants, and brokers helps law enforcement personnel strategizing methodical plans for efficient disruption.

A Strategic Analysis of Drug Trafficking Network

Julia Burnside, Aneeza Hussain, Katie Salas
Prof. Urmi Ghosh-Dastidar

In this project we analyzed connected criminal networks (CN). We used the spectral clustering method (SCM) to partition CN into clusters such that actors within a cluster are more connected to each other than between two different clusters. Moreover, we experimented on improving this partitioning using a combination of SCM and linkage-based density techniques (LbDT). While the CN was successfully partitioned based on SCM, the LbDT method with SCM did not improve the partitioning. Therefore, we tested this medley of two methods on two networks of different densities, and this resulted in improved partitions on the network with higher density. Prompted by this result, we experimented studying the effects of network densities on partitioning CN using the combined method of SCM and LbDT on various networks of different densities. This work can assist law enforcement personnel in evaluating which actors or criminals are more connected to each other, and thus help them to strategize an efficient plan for disruption.

"Our Stories" First-Year Transition to College

Kamara Smith, Katelyn Lopez, Asset Mballo
Prof. Mery Diaz

This semester, we participated in the "Our Stories" qualitative research project that involves learning more about students' first-year, and first-semester experiences at City Tech during pandemic times. As we organized and read students' posts, we journaled and practiced reflexivity, a qualitative research process that helps us examine how we are interpreting the data that we are engaging with. T Reflexivity is a process in qualitative research involving frequent examination of one's position in the project. These positions include one's assumptions, feelings, and so forth. An essential question for qualitative researchers, according to Leavy (2011), is "Has the researcher engaged in an ongoing process of reflexivity?" (Leavy, 2011. P. 140). The following is an exploration of our use of the reflexive journaling process for the "Our Stories" project and our initial interpretations of the first-year student narratives about their experiences during pandemic times.

Ferrate VI: An Environmentally Friendly Oxidant for Water Treatment

Le Van La
Prof. Vishwas Joshi

Safety water treatment plays a significant role in public health and welfare. A variety of requirements for a chemical substance involved in water treatment has been focused on disease prevention as a disinfectant, removal of toxins, and harmless behavior to human health and the aquatic environment. Ferrate (IV) or Iron (VI) is an oxidizing agent that meets all of the requirements above with a reduction potential varying from +2.2 V to +0.7 V in acidic and basic solutions [1]. Compared to other oxidant alternatives (chlorine dioxide, iodine, bromide, ozone),

Ferrate(IV) has unique properties to react with other contaminants to form non-toxic compounds, non-mutagenic, non-carcinogenic by-products during water treatment processes [1].

The research is mainly focused on several reasons that indicate the potential and promising properties of Ferrate (VI) as an environmentally friendly oxidant. This shows how Ferrate (VI) behaves as an effective reagent for the water treatment processes, including purifying raw water from toxin heavy metals like Cadmium - Cd (II) [2], inactivating a wide range of pathogenic microorganisms, for instance, *E.coli* lived in wastewater [1].

During water treatment, one of the properties is that Ferrate (VI) has the ability to degrade an antibiotic substance named tetracycline and its resistant bacteria *E.coli* [3]. This project is conducted online by using, summarizing, analyzing, and organizing relevant literature, articles, and scientific journal data that are available via open sources, library databases, and the world wide web. The project will present some properties that Ferrate (VI) behaves as a competent disinfectant and a green oxidant which is sufficient for the wastewater treatment processes to benefit human wellness and the aquatic environment in the long term.

Covid-19 Vaccine Mandate Effects
Mikhail Kun
Prof. Zoya Vinokur

The COVID-19 pandemic has wreaked havoc on the planet and killed millions of people. Health care workers and radiology technicians who come into direct contact with COVID-19 patients have indeed been the most affected by the virus. Since the pandemic began, the COVID-19 cases among health care workers have surged and quadrupled. COVID-19 vaccine mandate is the need of the time. Mandates have a history and are in effect for other diseases such as smallpox, measles, or mumps. But since the vaccines have come out for COVID-19, there is a public impetus to condemn these vaccines, based on the false assumption that the Covid-19 vaccines are not safe. One primary reason the COVID-19 vaccines are being viewed with skepticism is that they came out in short span and the fact that they have not been subjected to animal trials or been thoroughly tested in populations large enough to detect most side effects. The present study is survey based and designed to estimate the pro-vaccine attitudes among health care and radiology students regarding vaccine safety. This study is not only an important resource for patients and public education but holds significance for disproving any myths surrounding the vaccine.

Hardware and Software Co-design of Assistive Technology
Modhumita Dey
Prof. Farrukh Zia

In Computer Engineering Technology major, students learn how to combine computer hardware and software to make devices to solve real life
problems. In this research project Math, Physics, Computer Hardware, Computer Software knowledge is used to develop a computer based device

for Assistive Technology application. Assistive Technology (AT) refers to the use of technology to assist people with physical or learning disabilities.

The Structure and Analysis of calpains in Tetrahymena Thermophila
Olorundamilola Okemeta
Prof. Ralph Alcendor

Tetrahymena thermophila is a model organism in biomedical research. *T. thermophila* belongs to a ciliated Protozoa, a major, ecologically successful monophyletic group of unicellular eukaryotes and freshwater organisms that inhibits streams, ponds, and can be found almost everywhere. These cells have been used in studies such as cell cycle, cell death, cell structure and function, and telomerase. Calpains are a family of ever-present expressed calcium-dependent, non-lysosomal cysteine proteases. While mostly calcium-dependent, calpains may also be activated through ERK-mediated phosphorylation. In humans, calpains are involved in apoptosis, cellular proliferation, and cell motility. The functional role of calpains was also associated with myogenesis. Calpains are found in almost all eukaryotes and some bacteria, but not in archaebacteria. Human beings have 15 different calpains classified as classical or non-classical. Classical calpains have a penta-EF (PEF) domain while the non-classical calpains do not. Although the genome of *T. thermophila* has been sequenced, little is known about the function of calpains in this organism. This research project is involved in characterizing TTHERM_00259450, one of the 27 calpains found in *T. thermophila*. Multiple sequence alignments were done using MUSCLE, MAFFT and T-Coffee while phylogenetic analysis was done using MEGA X. Results from these tools suggest TTHERM_00259450 may be more closely related to human calpain-7. Further analysis such as protein structure modelling will help confirm the relationship between TTHERM_00259450 and human calpain 7.

Study of Pregnancy Related Deaths in United States
Oneisha Conway
Prof. Avis Smith

To find why pregnancy woman in certain races in distinct parts of NY area and US was higher than most. According to the News 7, reporter says during the pandemic a 26-year-old who gave birth during coronavirus never saw her baby and what was the cause of her death. Statement taken from Montefiore 1"94% of our deliveries are minority womans and Montefiore's maternal mortality rate of 0.01% is lower than both New York City and national averages." (Kim, 2020) Maternal mortality rate is the annual number of female deaths from any cause by pregnancy during the first year. Claims to be the better hospital in Bronx dealing with this crisis of minority woman being treated unfairly especially during the pandemic. Taken from another article, 2"The maternal death rate for black women was more than double that of white women: 37.1 deaths per 100,000 live births compared to 14.7. It was also more than three times the rate for Hispanic women (11.8)." (Belluz,2020) Society has been discriminated against minorities for centuries, medical technology has advanced but the way people treat each other has not. Why? The world may never know. Others may say it is what is taught and learned in the household or upbringing. the problem that led to pregnancy woman in the US are the financial needs, not enough equipment, or knowledge

to prevent accidents like bleeding through pregnancies. As far as the solution, justice must be done because more of the cases are minority females deaths occurred than other races due being social services or being less fortunate on the east and west coast of the U.S.

Compare how Students Performed and Attendance before, during and after Pandemic Waves
Peber De Jesus, Rohini Mattan, and Ralph Lauren Ocampo
Prof. Zoya Vinokur

Covid-19 is a global pandemic that affected many people that includes students from all different parts of the world. In this case, the research would focus on the Radiologic Technology and Medical Imaging program students at New York City College of Technology, who must do hands-on learning in order to accomplish the experience required for the degree. One of the hardest obstacles that radiologic students have to go through are the ones that are unable to be online. One example of those required classes would be the Clinical Rotation. It is mandatory for the radiologic student to go to a required hospital site and complete the necessary hours and competency to get passing grades. The Radiologic Technology and Medical Imaging Radiology is a degree where students must deal with patients and have in-person contact in order to take the best diagnostic medical images. The covid-19 virus was spread to the whole United States and was announced a pandemic beginning in March of 2020. It got to the top peak level of exposure in hospitals within that time. In order to gather the data that would be used in this research, surveys would be sent out to both Juniors and Seniors in the program. which would represent the answers to how the pandemic affected students. Comparisons are going to be made on how students did and attended through the pandemic and after the pandemic between juniors and seniors. Analysis of how Radiology tech students attended school before, throughout, and after the pandemic (when vaccines were out), are going to be further critiqued and explained.

Once the Surveys have been answered the research would create a data and graph that would be analyzed in order to compare the Attendance and Performance in the Year 2020 to the Year 2022 to see if there were any changes that affected the student during those pandemic years. This is continuous research as the Covid-19 Pandemic is still active as of this day.

The Start of a New Revolution: Addressing Government Failure in Ending Homelessness in NYC
Ruth Joseph
Prof. Laura Westengard

The Start of a New Revolution: Addressing Government Failure in Ending Homelessness in NYC, Ruth Lovely Joseph; Laura Westengard; This project is about homelessness in New York City. The project will involve research to establish the problem and to develop a detailed proposal about a community-based approach to homelessness. As part of the initial research to establish the

problem, I watched "How Do Homeless Women Cope With Their Periods?" by *Bustle* and "What Beauty Is Like For Homeless Women On The Streets" by *Refinery 29*. Both of these videos are about how female homelessness is being treated in the world. I believe that both men and women need protection, but women who are homeless are more vulnerable. Further, in my experience when I walk through the streets or the train station, I see that most homeless people need a place that is warm and safe and a place where they don't feel alone. Based on these two things, I realize that even though the government claims that they are helping homeless people, they aren't doing so sufficiently because then the problem wouldn't continue to exist. People are losing jobs and homes, and the government should have a plan to help people so they don't become homeless. Everyone needs a place to stay, and I was encouraged to do this project because we are all human beings that deserve love, care, and a warm place. No one deserves to be homeless. This project will involve proposing a solution to the ongoing problem of homelessness in New York City. The solution will outline a community-based organization with multiple elements, including a self-sustaining structure with outreach, a restaurant, health services, clothing, temporary housing, and job skills training. Even if someone has done bad things, it doesn't mean they deserve homelessness. People do bad things to others because bad things have happened to them--it is a cycle. This project is designed to break this cycle.

Identifying Protein-Protein and Specific Protein-DNA Contacts using Programming Tools
Samantha Lee
Prof. David Giganti

Protein-protein interactions (PPIs) play a key role in many biological processes. PPIs perform a variety of activities, including as modifying enzyme kinetic properties, starting metabolic processes, activating or inhibiting proteins, changing protein specificity, regulating upstream and downstream levels, and transporting substances. PPI research can aid in the discovery of underlying molecular pathways in cells. Protein–DNA interactions happen when a protein comes into contact with a molecule of DNA, most often to regulate the biological function of DNA, which is often gene expression, which is essential in research. This study will go through several instances of how to extract distances between atoms and protein-DNA contacts using multiple Python libraries and the software program Pymol.

America through Immigrant Eyes
Samuel Cheung
Prof. Peter Catapano

The cinematic depiction of the immigrant experience has been a staple of the medium since the silent era. Through the use of such films in the classroom, students may be introduced into the discipline of immigration history. The participants researched feature films with immigrant themes and chose representative examples that covered the diversity of their experiences during the 19th and 20th centuries. The poster presentation paired feature film sources with significant periods of

U.S. immigration history. A select list of recommended films with short plot summaries and divided by region of origin and time period is also available upon request.

Mechanical Characterization of Engineered Scaffolds
Sandya Persaud
Prof. Ozlem Yasar

The mechanical characterization of engineered scaffolds, better known as tissue engineering, has aimed to be of aid in organ transplantation and tissue regeneration. The man made design and fabrication of scaffolds help to grow and secure cells into three-dimensional conditions. In tissue engineering, the hydrogel polymer PEGDA, polyethylene glycol diacrylate, is a biodegradable and biocompatible material regularly utilized. In this research, the photolithography technique is executed to fabricate the scaffold. PEGDA is mixed with a photo-initiator solvent to create a substrate in a wafer that will be coated, so that the wafer is prepared to accept the photoresist by producing a clean surface. Then, the wafer is exposed by a UV light that is traveling through a mask to the resist. Through developing and etching the initial liquid structure of the PEGDA photo-initiator solution should finally be solidified and take the form of molding shape. As a result, PEGDA can be controlled to be strong enough to be implanted in human bodies and help many.

Convoluted Neural Network – Image Classification
Sisiame Sakasamo
Prof. Marcos Pinto

Convoluted Neural Networks (CNNs) are algorithms used in computer vision where the objective is to make computers view the world as human beings view it. Among the challenges to accomplish this is image recognition/classification, or the ability of computers to identify entities in images. These entities can include, but are not limited to people and objects. The purpose of this research project is to identify practical uses to implement image classification in everyday life, as well as further explore methods to classify images efficiently and effectively. The project utilized the Visual Geometry Group (VGG) model implemented through Python programming to classify a dataset of images. A dataset of apparel images, provided by Kaggle, was analyzed to test the effectiveness and practicality of the VGG model. In the end, the software was able to recognize various apparel to above 90% accuracy, with around 11,385 images used to train the model. The apparel analyzed included dresses, pants, shirts, and shorts, with colors including black, blue, brown, green, red, and white. Although highly accurate and effective in identifying and classifying apparel by type and color, further research on program runtime, as well as comparison to other image classification machine learning models is necessary to determine how efficient the VGG model is. Despite this, the model is effective, as the software is able to train an apparel image recognition model in under 30 minutes on a mid-high end, 4 year old personal laptop.

Data Loss Caused of Nature Disaster
Svetlana Idrovo Shindler
Prof. Patrick Slattery

Bitcoin is a digital currency, a leading type of cryptocurrency. It is a secure digital monetary transaction value or price which allows you to use it as a financial asset in transactions. A digital investment in Bitcoin can be initiated by purchasing Bitcoin (symbol BTC) with a fiat currency or another digital currency then Bitcoin may be use as money in a transaction.

The price of Bitcoin changes constantly and can seem unpredictable. Because Bitcoin is traded globally, 24-hours per day. Many different people are involved in the balance of supply and demand which sets the price for Bitcoin.

The purpose of this research is to test the argument that is impossible to predict the price of Bitcoin in near future. Through this research I train machine learning models, using Bitcoin data to predict currency and market prices in the near future and to check the accuracy of those predictions. The conclusion that I came to through this research, is that it is possible to predict Bitcoin prices over the near future but only with 60% confidence.

Novice Peer-leader Learning during Initial Training
Taspia Jannat
Prof. Nadia Kennedy

The project focuses on the learning of novice peer-leaders, who are currently in training and taking MEDU 2901: Peer-leader Training in Mathematics. Three surveys are administered throughout the semester in order to trace whether novice peer-leaders' views of the role of the peer-leader have changed as a result of their training. One of these surveys is distributed in the beginning of the semester and one in late April. An additional survey is given in late April to examine the perceptions of the novice peer-leaders on skills acquired during the peer-leader training. The collected data is organized and presented in a poster.

Mechanical Characterization of Nano-material Doped Polydimethylsiloxane (PDMS)
YeHun Jeong
Prof. Ozlem Yasar

In this project, dog-bone shaped PDMS testers are fabricated at the Research Laboratory SET in the Department of Mechanical Engineering Technology. Tensile tests are performed to investigate the mechanical properties of the PDMS. Similar procedure are also repeated for the nanomaterial doped PDMS to investigate the effects of nanomaterials on the mechanical properties of PDMS. Our preliminary results indicates that engineered scaffolds' mechanical properties can be improved with nanomaterials.