Book of Abstracts

The CUNY Research Scholars Program & Louis Stokes Alliances for Minority Participation Program

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Student Researchers	Faculty Mentors	Department	Project Title	Page
Aaliyah Salmon ; Aravis McBroom; Joanna Syska	Profs. Subhendra Sarkar, Evans Lespinasse	Radiologic Tech and Medical Imaging	**Heat Shocked Porous Media: X-ray Experiments to Reveal Abnormal Nutrient Distribution in Mineral-Rich Fruits**	6
Abdullah Momin, Billal Badar, Frank Lema,	Prof. Daniel Wong	Communication design	**Analysis of Web Traffic Based Upon Content and Paid Advertising Campaigns**	6
Angela Moore, Katie Tam	Profs. Subhendra Sarkar, Evans Lespinasse	Radiologic Technology & Medical Imaging	**Designing of X-ray Beams to Assess Mineral Loss in Dehydrated Fruits - Radiology Readiness During Climate Change**	7
Arham Hussain, Reginald Metellus	Prof. Marzi Azarderakhsh	Construction Management and Civil Engineering Technology	**Studying Factors of Environmental Injustice and Ways to Achieve Equity**	7
Ashanti Belone	Prof. Farruhk Zia	Computer Engineering Technology	**How Will Climate Change Affect the Future**	8
Daler Djuraev, Somdat Kissoon, Robert O'Brien, Nino Djarishvili	Profs. Subhendra Sarkar, Zoya Vinokur, Lillian Amann	Radiologic Technology & Medical Imaging	**X-Ray and MRI Theory for Mineral-Rich Fruits Affected by Heat Waves During Climate Change**	8

Fatimah Asad	Prof. Lubie Alatriste	English	**STEM or Social Studies: Online Education Preference Based on Subject Area**	8
Ferasuddin Siddiqui, Louidelson Deguerre, Steven Boodram	Prof. Daeho Kang	Environmental Control Technology	**Development of Practical Method to Quantify Infiltration Rate Through Building Entrance**	9
Fernando Santana Perez	Prof. Lubie Alatriste	English	**Animal Research and Mother Cells**	10
Gabriel Martinez	Prof. Jose Martinez	Radiologic Technology & Medical Imaging	**The Impact of Polio onto the Modern US Healthcare System**	10
Hudda Siddique	Prof. Patrick Slattery	Computer systems technology	**Business Information Security Office (BISO)**	11
Husnain Khan	Prof. Akm Samsur Rahman	Mechanical Engineering Technology	**Additive Manufacturing Process Development of Geopolymer Based Habitable Construction on Space**	11

Iqra Khan	Prof. Xiaohai Li	Computer Engineering Technology	**City Prime: A Heteromorphism Robot**	11
Jaden Burke	Prof. Olufemi Sodeinde	Biological Sciences	**Bird Identification via DNA Extraction**	12
Jason Lin, Ethan Pruzansky, Kazi, Tasin, Tanvir Rahman	Prof. Patrick Slattery	Computer systems technology	**Code Cyber: Using an AI model to Analyze the Rate of Inflation in the United States within a Statistical and Data Science Context.**	12
Junxi Chen	Prof. Ann Ngana Mundeke	History	**The Impact of Climate Change**	13
Lauren Gordon, Liana Reid Ollana John	Prof. Anthony DeVito	Radiologic Technology & Medical Imaging	**Monitoring Absorbed Dose Changes in Parent/Caregiver in the X-Ray Room Using the Principles of Radiation Protection**	13
Makadeer Kassim	Prof. Jennett Ingrassia	Radiologic Technology & Medical Imaging	**The Motivating Factor Towards a Career in Radiologic Technology and Medical Imaging at New York City College of Technology**	13

Mohammed Jalloh	Prof. Alexander Aptekar	Architectural Technology	**Green and Passive Architecture Prototyping**	14
Rex Wong, Qingqing Zhuo	Prof. Patrick Slattery	Computer systems technology	**A Study of the Environmental, Social, and Governance of Electric Battery Technologies**	14
Shahat Alam	Prof. Nan Li	Mathematics	**Classifying Public Companies by Sector Using a Machine Learning Tree Model in R**	14
Shana Ramnarain	Prof. Alyssa Adomaitis	Business & Technology of Fashion	**Lookism: An Investigation Into Discrimination in Workplace Practices**	15
Tiya Williams	Prof. Elizabeth Milonas	Computer systems technology	**Importance of Incorporating Computer Ethics in Computer Curriculum**	16
Victor Arenzena, Yehya Elfgeeh	Prof. Ivan Guzman	Construction Management & Civil Engineering Technology	**Green Roof System Integrated Soil Methods**	16

Heat Shocked Porous Media: X-ray Experiments to Reveal Abnormal Nutrient Distribution in Mineral-Rich Fruits

Aaliyah Salmon, Aravis McBroom, Joanna Syska
Profs. Subhendra Sarkar, Eric Lobel

Minerals exist within biomolecules in food and are not detectable in their natural form by routine analytical techniques. X-ray imaging depends solely on atomic mass, density, and photoelectric peaks, while MRI images depend on moisture content, sample porosity, magnets, and protocols. Using low energy x-rays and photoelectric absorption the minerals; iron, manganese, and copper which are transition metals, were detected in mineral rich fruits like apples. However, we found that the minerals discovered were inconclusive due to their imposing similarity in K-edges. The use of intrinsic filters like Rhodium and Silver along with the extrinsic filter, Iodine aids in removing K and Mn from apples by using L-Edge of all three filters. The 3 minerals of interest (Fe, Mn, Cu) are hard to differentiate due to their close K-Edge. Comparing with MRI images, we can exclude Cu since our x-ray and MRI images match exactly and MRI selectively shows Fe, Mn rich regions without Cu. Our next goal would be to address porosity with both modalities x-ray and MRI since environmental heat waves will affect porosity of biological tissues. Thus, the goal to image mineral dynamics with heat was partially met. The use of heat shock displays the change in distribution because the minerals change both shape, porosity and brightness. The overall conclusion is that it cannot be definitively claimed that the results prove Fe redistribution with heat shock.

Analysis of Web Traffic Based Upon Content and Paid Advertising Campaigns

Abdullah Momin, Billal Badar, Frank Lema
Prof. Daniel Wong

The Communication Design program aims to prepare students for a variety of careers in industry. They include but are not limited to digital design, marketing strategy, copywriting, front-end development, mastery of design applications and other technical skills.The purpose of this research touches upon the understanding of the program from the student's point-of-view. We will help students to evaluate the courses, understand what careers are available upon graduation, learn to combine a variety of courses that will lead them to these various careers, and find out what interests them the most. We are marketing directly to new students who are not currently enrolled using search engine optimization techniques.We aim to execute a variety of activities. We are designing a questionnaire to interview professors to find out the skills necessary for students who are successful in a course. We attempt to anticipate possible answers, crafting questions that are targeted and open-ended, to get the most out of our interview. We will also be looking at the job market and what is available to graduates of the program.If we are successful, we will begin to understand the interests and backgrounds of the instructors, which we hope will help us to guide the students into potential careers. The outcomes will be the development of content for the website which is interesting to both the students and structured in a manner which is search engine optimized. We will show potential students how courses combinations lead to specific jobs. Prospective students, and those who come via the marketing efforts of this website will start to understand the courses they should take with a clear view of their goals. New students will be interested in joining the program, and the COMD marketing website will have fresh new content.

Designing of X-ray Beams to Assess Mineral Loss in Dehydrated Fruits - Radiology Readiness During Climate Change
Angela Moore, Katie Tam
Profs. Subhendra Sarkar, Evans Lespinasse

Key minerals such as iron, manganese, and copper are necessary for the optimal health and vitality of human beings. These minerals are within the biomolecules of food, particularly in fruits, and are not detectable without destroying their natural biochemical roles. A compilation was done on average mineral compositions for multiple apple varieties from USDA and academic horticulture research labs to design the x-ray beams in the low energy ranges in our mammography system that provide "soft" x-rays for imaging light-weight atoms. In this project homemade external filters like Aluminum sheets, Iodine, and Gadolinium contrast media were developed to modify low-energy X-rays for more dedicated detection of each of these minerals. The absorption patterns and utility of such modified x-ray beams were analyzed. Differentiation between the imaging of iron and other minerals was challenging but a common distribution pattern from the core to the cortex of the apples was observed for all varieties of apples tested.

Studying Factors of Environmental Injustice and Ways to Achieve Equity
Arham Hussain, Reginald Metellus
Prof. Marzi Azarderakhsh

In today's day of age, the biggest concern for current and future generations is the environment. The urban heat island (UHI) with its significant energy, health, and societal impacts is among the major environmental issues in urban regions, especially in historically underserved and socially vulnerable communities (HUSVCs). In the 1930s, the former federal agency, Home Owners' Loan Corporation (HOLC), created "Residential Security" maps of major cities, known today as "redlined" areas. These neighborhoods were often designated as "hazardous" due to the high percentages of people of color living there, leading to systematic disinvestment based on race. While the program ended in 1968, the impacts of discriminatory lending are still experienced in redlined areas in the form of urban hotspots. The advent of new technologies and availability of environmental data from satellite remote sensing such as land surface temperatures from ESA's Sentinel-2 and GIS tools , could improve our understanding of these heat impacts and be used to develop and assess mitigation and resiliency strategies.

How Will Climate Change Affect the Future
Ashanti Belone
Prof. Farruhk Zia

Climate Change has played a massive role in the habitat of us earth dwellers and the animals that co-exists with us. I believe that essentially climate change plays a massive role because this can dictate whether or not the earth is habitable and if a need for evacuation is necessary. Many might believe that climate change only refers to the rising temperature but that's just the icing on the cake. Earth is a system that is very much connected, this means that changes in one area will set off a chain reaction allowing these changes to happen in many other regions. It is our job to protect our home and maintain the organisms living in it by being mindful of the types of things we use

because they can change the continents of the gases we breathe and as stated above it can lead to earth being inhabitable for all.

X-Ray and MRI Theory for Mineral-Rich Fruits Affected by Heat Waves During Climate Change
Daler Djuraev, Somdat Kissoon, Robert O'Brien, Nino Djarishvili
Profs. Subhendra Sarkar, Zoya Vinokur, Lillian Amann

Conventional Nutrition facts data relays the amounts of different minerals in apples. This information from such analysis may not connect these minerals with their natural biochemical or functional state for health or disease. These minerals may also be part of different particle sizes that affects X-ray transmission, absorption and scatter. The minerals may also redistribute within the tissue over time with or without heat shock. Current Medical Imaging procedures (Xray and MRI) do not localize such minerals. Our work offers a way to increase detection sensitivity of transition metals in various apple varieties non-invasively. This can constitute a step in the detection and localization of these minerals in the natural biological unprocessed tissue. Our experiments also utilize detailed analyses of scatter in X-ray or MR images to correlate literature based porosity to model mineral distribution in apples. These tests were done on a small sample of a few varieties of locally grown apples. Our model of the movement and particle sizes of minerals within tissue needs to be verified in large batches of apples and other fruits before it can be tested on complex biological tissues like the human brain.

STEM or Social Studies: Online Education Preference Based on Subject Area
Fatimah Asad
Prof. Lubie Alatriste

In this project, we can examine the benefits of online education as well as its shortcomings. We aim to look at specific areas such as STEM and compare them to social studies. We want to see if there is any difference in how students perceive online education based on their area of study. We hypothesize that STEM may be more challenging to do online, but our results, which we can collect via carefully designed survey instruments, will either confirm or disconfirm the hypothesis. Online learning is one of many ways that students can learn, apart from being in their in-person classrooms. At the height of the pandemic, remote, or online learning, was the singular and the only way that students were able to continue their education safely. Through this brief introduction to the world of technology, teachers and students worked together toward a common goal: furthering education. Yet, sometimes, the goal was not always clear, as we were all in an environment that had its limitations. Could I learn even with background noise? What about when my internet goes out? What if my teacher's internet goes out? Considering a time that did not leave many options, we can examine the benefits of online education as well as its shortcomings. By looking at specific areas such as STEM and comparing them to our research studies, we can effectively see how students perceive online education. Online education, currently, is not considered to be favorable amongst in-person or hybrid learning. Rather, in the conducted study, students share no favoritism and do not share any preference toward a particular learning method. 4 students shared that they prefer in-person learning, 4 students shared that they prefer hybrid learning, and 4 other students shared that they preferred remote learning. Our experience with

COVID tells us nothing about the possibilities of publicly available virtual learning as part of our educational environment since most teachers were inexperienced virtual teachers and few had the assistance or time to learn how to teach successfully online. We know that effective education, both virtual and in-person, involves students interacting with the teacher and with one another about the subject. Over the years, the discipline has accumulated knowledge regarding how to give successful in-person training. However, virtual learning has not been widely used prior to March 2020. Many students initially struggled to gain access to a comprehensive instructional program, and even while schools' attempts to give students with digital access succeeded in many locations, teachers were experimenting with foreign pedagogies, with typically poor outcomes. Increased contact points between instructor and student and between peers (e.g., phone calls, small group teaching, and focused feedback) improved the quality of virtual learning, but few teachers have learnt how to foster dynamic interactions in their classrooms. As a result, for many students, virtual learning is still a poor substitute for in-person education.

Development of Practical Method to Quantify Infiltration Rate Through Building Entrance
Ferasuddin Siddiqui, Louidelson Deguerre, Steven Boodram
Prof. Daeho Kang

Infiltration through entrance doors, vestibules, cracks and other areas have a large impact in building energy consumption. It also has a significant impact on indoor air quality because it allows outdoor particles, gaseous containment and moisture inside. There are only a few studies about air infiltration and air tightness. Most research that has been done only focuses on residential buildings and not commercial buildings because it has not been viewed as a major issue. The little information and research done has left the energy standard of warehouse and production buildings lagging behind. The purpose of this study is to develop practical methods to measure air infiltration rate to help reduce energy use and improve indoor air quality. We have read research articles and identify several methods in the literature. The traditional methods, the blower door method which measures air infiltration rate is disruptive to occupants, does not locate where infiltration occurs and takes lots of time to set up and take down. Thermographic images of a building were used to identify crack size and infiltration rate. Infrared thermography used with the blower door method helps locate the cracks inside the building and the size of them which can help calculate inflation more accurately leading to better building energy consumption. Further investigation is required to help more accurately find infraction rate, crack size and location of cracks to help reduce air infiltration, energy costs, maintain comfortable indoor conditions and lower buildings carbon footprint.

Animal Research and Mother Cells
Fernando Santana Perez
Prof. Lubie Alatriste

This project builds on stem cell research for use in humans in the field of modern medicine and science. The purpose of my research is to extend focus of the earlier project Animal Research by exploring the field of modern medicine and stem cell biogenetics to regenerate organic tissues in humans, from whole organs to complex body parts and limbs. "Scientists must also develop procedures for the administration of stem cell populations, along with the induction of vascularization (supplying blood vessels), for the regeneration and repair of three-dimensional solid tissues". So, why should one do stem cells and not genetic engineering? Because genetic engineering is very closely related to animal research and it would be repetitive to touch that topic

superficially; Second, stem cells may sound simple, but the whole field and research is very complex. Finally, I have a deep personal interest in the infinite uses that this type of medical and scientific advances would have. In order to collect data, a questionnaire as a data collection instrument was designed. It consists of a limited number of the questionnaire (four questions) and questions on demographics, such as students' GPA, major, number of semesters completed in college, and age. The demographics are central in order to be able to draw a relationship between that personal information and the respondents' answers to the research questions. The preliminary findings seem to indicate that. Also, these data (in addition to the research itself) can help us realize how much the general population of NYCCT takes into account the field of modern medicine in general, if they have a lot or little interest, or if they do not know absolutely anything. Which would be a good initiative to encourage workshops and/or free courses related to the subject to encourage students to enter careers related to medicine.

The Impact of Polio onto the Modern US Healthcare System
Gabriel Martinez
Prof. Jose Martinez

Polio struck the United States hard from the 1940s to the mid-1950s, and this deadly and debilitating disease paved the way in defining a new era of Healthcare in the United States. From a booming increase in safe healthcare practices to new pharmaceuticals and vaccines from insurance giants seizing the opportune moment to create record profit margins, it is my goal to research and discover just how vast of an impact Polio had on the US Healthcare System we know it, and if it caused any detrimental or negative impacts on our healthcare system today.

Business Information Security Office (BISO)
Hudda Siddique
Prof. Patrick Slattery

As technology develops in the 21st century, everything is connected through a network. Enterprises are highly dependent on that network connectivity to develop and succeed. The Information security role has become critical to protect sensitive information from threats such as cyber-attack, and other information incidents to ensure the success of the business. We cannot rely on technology every time because one mistake could compromise the organization's reputation, financial impact and value. This research project is to study the Business Information Security Officer (BISO) role: its responsibility, strategy, and how BISOs handle threats. We will look at what knowledge a BISO should have and what skills required to be a BISO. BISOs need to have a combination of technical and business knowledge to maintain and improve information security in important aspects of a business. Whether a BISO needs to have an ISC² CISSP (Information Systems Security Professional), ISACA CRISC (Information Technology Risk Management), CISM (Information Security Management) or other certifications will be explored. In addition an understanding of risk management, and CompTIA Security+ qualifications will be studied. The role of a BISO is new and evolving – this study aims to contribute to the maturity of the role.

Additive Manufacturing Process Development of Geopolymer Based Habitable Construction on Space
Husnain Khan
Prof. Akm Samsur Rahman

Extraterrestrial travel and housing are topics that have come up in recent times. There is a possibility of living on the moon. In order to do that while keeping costs at a minimum, we are researching and developing a geopolymer using lunar dust to 3D print houses on the moon. Because we are using lunar dust, the number of materials that need to be shipped out gets cut dramatically. We are studying the composition of both lunar mares and lunar highlands in order to fully understand what needs to be added to make a strong durable geopolymer that can withstand the varying factors and temperaments of the moon. By looking at aluminum and silicon ratios, as well as KOH, we aim to create a geopolymer that can make houses on the moon.

City Prime: A Heteromorphism Robot
Iqra Khan
Prof. Xiaohai Li

In this research project we will design and develop a heteromorphism robot that can reform its structure and locomotion mechanism between a ground rover and a humanoid robot depending on the environment, terrain and desired tasks. Our project will create a novel robotics platform that may lead to new application opportunities of robotics in disaster response, service, education and other related fields. In this project, we will first design and build a humanoid robot, then create additional morphism and locomotion mechanism design, add and integrate additional components to enable heteromorphism . We will program the robot to perform various tasks including changing from a ground rover form to a humanoid form. As the first half of the project, we are working toward the finish of the design and development of the humanoid features of the robot by this semester.

Bird Identification via DNA Extraction
Jaden Burke
Prof. Olufemi Sodeinde

Non-invasive techniques have been used in studying diet, determining which animals are present where, and have been used to determine the sex of birds without needing to physically capture and examine them. DNA barcoding has enabled all of these. In this study, we sorted feather samples collected from two sites in New York City, Canarsie Pier, and Prospect Park. We have extracted DNA from two Canarsie Pier samples using QIAamp DNA Investigator Kit. This process began with the cutting up of bird feathers, which were then transferred to microcentrifuge tubes. Afterwards, buffer ATL, proteinase K, our enzyme, and DTT were used in order to fully digest the feathers. The remaining steps in the protocol were followed to complete the DNA extraction. The respective DNA yields for our two samples CP 7 and CP 12 measured using the Nano Spectrophotometer were 8.6 ng/µL (CP 7), and 17.1 ng/µL (CP 12). We are continuing with the extraction of DNA from more feather samples. Subsequently we will amplify segments of the extracted DNA using the barcoding genes cytochrome *cyt b*, COI, D- loop and the CHD gene located on the avian sex chromosomes to identify the sex of the birds using PCR. PCR products will be sent for sequencing at GenScript.

Code Cyber: Using an AI model to Analyze the Rate of Inflation in the United States within a Statistical and Data Science Context.
Jason Lin, Ethan Pruzansky, Kazi, Tasin, Tanvir Rahman
Prof. Patrick Slattery

Artificial intelligence (AI) replicates human intelligence in robots trained to think and act similarly to humans. The word can also be applied to any computer that demonstrates characteristics linked with the human mind, such as learning and problem-solving—improving critical business processes by accelerating and refining strategic decision-making processes. To determine the inflation rate in the United States, we intend to employ an AI model. By creating an AI model to find the inflation rate, we can predict and determine how high it might become throughout the coming years as the US dollar loses its value yearly. We will explore how data science helps people discover how it can be used in real-world situations, such as determining the inflation rate. We will be compiling the data in an easy-to-read format that is straightforward and coherent for the average user. We also aim to highlight the importance of data science in our project.

The Impact of Climate Change
Junxi Chen
Prof. Ann Ngana Mundeke

Climate change is long-term shifts in temperatures and weather patterns by human actions. However, Climate Change has brought significant changes in the world. This Research Project points out the main factors that cause climate change. The impacts of Climate Change are numerous including economic impacts, social impacts, and environmental. This project focuses on the environmental impacts of climate change.

Monitoring Absorbed Dose Changes in Parent/Caregiver in the X-Ray Room Using the Principles of Radiation Protection
Lauren Gordon, Liana Reid, Ollana John
Prof. Anthony DeVito

Radiation safety practices reduce dose to both the patient and the radiographer. There are cases when exposing a patient to radiation an additional individual may be present during the exposure and their safety is also monitored. The purpose of the experiment is to monitor how dose is absorbed in a secondary individual during the x-ray exposure using the principles of radiation safety. Exposures were taken with and without shielding and with and without collimation, while distance increased. Our test subject is a half body phantom (chest) that would represent a parent if they were in the room with their child during the x-ray exposure. The child is positioned for an AP Chest on the x-ray table. All technical factors remained the same (40" SID, OID kept at a minimum, 60 KV (for pediatric chest), AEC and pascal dosimeter used. Exposures were taken at 9 ½ x 8 ½ (W x L) collimation with and without shield and no collimation at 17 x 17 with and without shield, and distance increased laterally from the x-ray table by 1, 3 and 6 ft. The expected result is that absorbed dose in the parent will decrease as distance increases. Dose will also decrease as collimation is increased and shielding is applied. With the 17 x 17 collimation, without shield, dose decreased by 20% as distance increased from 1ft to 6ft. With the 17 x 17 collimation

with shield, dose decreased by 13.5% from 1ft to 6ft. For the 9 ½ x 8 ½ collimation, with shield dose decreased by 11% from 1ft to 6ft. For the 9 ½ x 8 ½ collimation, without shield dose decreased by 13% from 1ft to 6 ft. This research is useful in radiation protection and reinforces the importance of using radiation safety practices to reduce dose exposure.

The Motivating Factor Towards a Career in Radiologic Technology and Medical Imaging at New York City College of Technology
Makadeer Kassim
Prof. Jennett Ingrassia

For this project we wanted to look deeper into what the motivating factor is as to why students want to enroll in the Radiology Technology & Medical Imaging major. While it is an extremely competitive program to get into, this can sometimes discourage students to pursue another career or profession without knowing the options offered. After speaking with a few people and seeing it on my own there was realization that a lot of us lacked the information we needed to succeed in this field. This research is primarily to focus on providing information to students and collecting data on the information they prior to deciding on the Radiologic Technology major. A good start to this is to seek information from students previously or currently enrolled in the RAD 1124 Introduction to Radiologic Technology course at City Tech as to the reasons for taking this course. For example, do they have an interest in the Radiologic Technology profession or are they taking the course to fulfill a full credit load for the semester. If so what modality in the field do they want to pursue and do they know how City Tech can support them to fulfill that goal. This is the focus for the research and we look forward learning more as we go.

Green and Passive Architecture Prototyping
Mohammed Jalloh
Prof. Alexander Aptekar

The evaluation is specific to the project location. I'm working on determining the embedded carbon and ecological costs of different materials. In particular I am also comparing traditional light wood frame construction to advanced design straw Bale construction. Start to looking up the different amounts of carbon that both materials would require and the distances of suppliers to the site so that you can determine the transportation costs of the materials.

A Study of the Environmental, Social, and Governance of Electric Battery Technologies
Rex Wong, Qingqing Zhuo
Prof. Patrick Slattery

Battery technology is indispensable for the global transition to a carbon-neutral future. As technology evolves, we find new battery technologies or find ways to improve existing technology. The big reason why battery technology is important would be found in increasing reusability and reducing environmental pollution. In addition to being a major part of our reliable reusable energy systems, batteries also power most of our everyday electronic items. Ensuring high battery cycle characteristics, and ensuring environmentally friendly production is of utmost concern. This research project will present how current battery technologies harm us and the environment, what are some of the promising new developments in battery tech., and what are some of the effects of adopting a new battery technology. Ultimately, the focus of this project would be on effective

research—and presentation of said research—to help foster interest towards the relationship between society and battery technology.

Classifying Public Companies by Sector Using a Machine Learning Tree Model in R
Shahat Alam
Prof. Nan Li

In this project we aim to produce a classification model that re-classifies public companies belonging to either the consumer staples or consumer cyclicals sector within the scope of the Covid-19 pandemic and the enforced nationwide lockdown. The pandemic not only changed our lives, it quite possibly allowed select industries and companies to shift sectors; more specifically, change from consumer cyclical to consumer staple or vice versa. How do we bring this into fruition? By utilizing a machine learning algorithm known as a decision tree in the statistical software R. Decision trees are an excellent method of classification analysis when you have labeled inputs and outputs for your data. It is crucial that we understand the literal and behavioral distinctions between sectors consumer staples and consumer cyclicals. Consumer staples regard companies that focus on goods and services that we as a collective consider to be essential or will refuse to quit buying thus consumer staples enjoy a constant stream of demand. As a result, enjoy a more stable stream of revenue and are less sensitive to gyrations in the economy. By comparison, consumer cyclicals consist of companies that sell goods or services that we as a collective may consider to be desirable but ultimately a non-essential. The demand for consumer cyclicals is, unsurprisingly, more cyclical in nature same with the pattern of sales. For this project, our inputs are variables that we think would give us an edge at determining which of the two sectors a company belongs to. To do so, we need to study variables that tell us something about how our data changes in order something that can identify a behavioral difference between the two factions. The data we sourced from the SECs database are just financial metrics like revenue, gross profit, etc. But an example of a variable we would use would be the standard deviation of quarterly revenue because it can identify which companies are sensitive to gyrations in the economy (representing consumer cyclicals) and which are not (representing consumer staples). Each of our labeled inputs have a corresponding labeled output in a binary '1' or '0' denoting either "consumer staples" or "consumer cyclicals". Currently, we are modeling and training our tree and are still awaiting the final product. Ultimately, we hope to produce a model to re-classify all the companies that fall under consumer staples and all companies that fall under consumer cyclical in the context of the pandemic and a nationwide lockdown.

Lookism: An Investigation Into Discrimination in Workplace Practices
Shana Ramnarain
Prof. Alyssa Adomaitis

"Lookism" is a term to describe appearance discrimination or "the practice of discrimination on the basis of physical appearance in the workplace" (Ghodrati, Joorabchi, & Muati, 2015, p.1). In culture and popular literature, it has been called "beauty prejudice" (Etcoff, 1999, p. 1). The notion that a pleasing appearance results in favorable outcomes (e.g., higher wages, promotions) from others is not necessarily new, as literature on physical attractiveness is rather extensive. The Washington Post Magazine first used the term "lookism" in 1978 (e.g., Ayto, 1999), however, the

term "lookism" was first recognized as a form of discrimination by authors of the Oxford English Dictionary and American Heritage Dictionary in 2000 (Ghodrati et al.). There can be social injustices due to physical appearance, whether physically attractive or unattractive. Rhodes (2010) discussed cultural injustices of being unattractive in a society appearance obsessed with potential for "looks" to influence hiring practices, such as better career options and higher pay. Those who feel unattractive in an appearance laden society could suffer certain mental health issues potentially causing anxiety, anorexia, and depression. Research is needed for clarity to combat the issue with regards to how lookism is defined and has been examine in hiring practices to further understand discrimination. Content analyses of academic articles written on lookism will be investigated. In addition, posting on social media by minorities and Caucasians will be compared.

Importance of Incorporating Computer Ethics in Computer Curriculum
Tiya Williams
Prof. Elizabeth Milonas

Ethics specifically in Computer Curriculum is a growing problem that has yet to be widely addressed. Although, start of computer ethics being taught has been traced back to the early 1940's it has not been standardized or implemented in all computer curriculum. The objective of this research is to diagnose the reasons why ethics is so crucial in computer curriculum at all levels. I used surveys to investigate whether students were taught ethics in their computer curriculum. I also conducted surveys for professors at universities and colleges if they were taught ethics while obtaining their degree, as well as if they teach ethics in computer curriculum. I also completed thorough research through CUNY colleges to find which colleges teach ethics in computer curriculum as well as the levels in which it is taught. The data suggests that while not all students have been taught ethics in computer curriculum, they are aware of the value. The results of my research indicate most CUNY colleges do in fact teach ethics in computer curriculum. This project will also provide insight into why it is so pertinent to have ethics in computer curriculum at all levels. These findings are different than those in the past because ethics in computer curriculum has changed, it has gotten more relevant and important in the day-to-day decisions of people creating computer systems, artificial intelligence and more.

Green Roof System Integrated Soil Methods
Victor Arenzena, Yehya Elfgeeh
Prof. Ivan Guzman

Green roof farms have contributed to deliver the benefits of the suburban environment to the urban setting. If every commercial building has a green roof farm, we can reduce the amount of energy needed to heat/cool the building. However, buildings have a limited capacity to withstand the additional loads imposed by a green roof including green roof infrastructure, growing media, and vegetation. These additions need to be light in weight, so buildings can carry them without adversely affecting the structure. Adding repurposed textile to lightweight engineered soil can modify the hydraulic properties of the soil without compromising its weight. The project focuses on studying the effects of adding textile to green roof soil on the weight and hydraulic conductivity of the soil. In previous research, an aspect ratio of 1 in. to 1in. of textile was used with results being similar and a significant change of 3% of textile in lightweight engineered soil. We are now testing lightweight engineered soil with repurposed textiles of an aspect ratio of 2 in. to ½ in. and recording any changes in weights and hydraulic properties. Therefore, studying the changes in

weights and water permeability of the lightweight engineered soil with different percentages of fabric can be delivered in this research. With these results and previous results, we will be able to develop more studies using different materials.