

SOURCE

SYMPOSIUM OF UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

FRIDAY, APRIL 23, 2021: 9:30 A.M. - 4 P.M.

VIRTUAL

REGISTRATION AND SESSIONS

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KEYNOTE SPEAKER

David Schwartz, Ph.D.

"Enrico Fermi and the
Art of Mastering a Subject"

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Dear New York Tech Faculty, Staff, Students, and Friends,

Welcome to the SOURCE 2021 at New York Tech!

Creative expression and participating in research with faculty members have become integral parts of a student's educational experience at New York Tech. SOURCE is intended to provide a unique opportunity for students to present their research and creative scholarly work in collaboration with faculty members and their mentors. SOURCE also provides a common ground for interdepartmental, interschool, and interdisciplinary communication. I am very pleased to inform you that this year 70 abstracts were accepted and 138 undergraduate and graduate students of New York Tech—representing all schools and colleges—have authored or co-authored these abstracts. The depth and breadth of the projects are strong indicators of the quality of our teaching and learning at New York Tech. I would like to take this opportunity to congratulate all the students for their academic excellence at New York Tech.

Many individuals in the New York Tech community have worked on the event to make it a success. I would like to extend a very special thank you to all the students, faculty, administrators, and volunteers who assisted with the preparation, management, and execution of SOURCE.

Because of the pandemic, all presentations will be given via ZOOM. As a result of this special mode of presentations, we are able to host many more individuals as participants. Please invite anyone who is interested in academic excellence of our students.

Sincerely,

Roger Yu, Ph.D.
Chair, SOURCE Committee

KEYNOTE SPEAKER



David Schwartz, Ph.D.

Enrico Fermi and the Art of Mastering a Subject

Based on his new book, *The Last Man Who Knew Everything: The Life and Times of Enrico Fermi, Father of the Nuclear Age*:

Enrico Fermi was one of the most significant physicists of the 20th century: at the center of the Manhattan Project, which developed the first atomic bombs, he created the first nuclear reactor; developed a comprehensive theory of how a radioactive process called “beta decay” created electrons and neutrinos in the nucleus of certain atoms; invented a way to introduce quantum mechanics into classical statistical mechanics; conducted some of the first high energy particle physics experiments; and was one of the first physicists to use computers to simulate physical processes. And this is just a sample of his work. How did he manage to achieve so much in such a short lifetime (he died at age 53 of stomach cancer)? What was the secret of his success? What can students starting out in a scientific career learn from Fermi’s example? This talk will briefly review Fermi’s life and achievements, and suggest that the secret of Fermi’s success lay not only in his innate intelligence but in his preparation for a career in physics and his focus on the field to the exclusion of virtually anything else.

About David Schwartz

David N. Schwartz holds a B.A. from Stanford University and a Ph.D. from the Massachusetts Institute of Technology. He has worked at the US Department of State, the Brookings Institution, and Goldman Sachs in both London and New York. He has published widely on US strategic nuclear weapons policy, NATO, and foreign policy. He is the author of the recently published biography of Enrico Fermi, “*The Last Man Who Knew Everything: The Life and Times of Enrico Fermi, Father of the Nuclear Age*,” (Basic Books). He lives in New York with his wife Susan. His father, Melvin Schwartz, shared the 1988 Nobel Prize in Physics for the discovery of the muon neutrino. (photo copyright Susan Schwartz.)

*Symposium on University Research and Creative Expression (SOURCE) 2021
Program*

9:30 a.m. - 9:40a.m.	INTRODUCTIONS Dean Dan Quigley and Associate Dean Elizabeth Donaldson
9:40a.m.-9:45a.m.	PRESIDENT HANK FOLEY’S MESSAGE
9:45 a.m. - 9:50 a.m.	PROVOST JUNIUS GONZALES’ MESSAGE
9:50a.m.-10:00am	HISTORY OF SOURCE
10:00 a.m. – 11:00 a.m.	KEYNOTE SPEAKER Dr. David Schwartz “Enrico Fermi and the Art of Mastering a Subject”
11:00 a.m. – 2:40 p.m.	ORAL PRESENTATIONS
2:40 p.m. – 3:40 p.m.	POSTER PRESENTATIONS

Oral Presentations 11:00a.m.- 12:20apm.	Room 1 Moderator/Host: Nicole Calma-Roddin Melissa Huey	Room 2 Moderator/Host: Sophia Domokos Bryan Gibb	Room 3 Moderator/Host: Colleen Kirk Katherine Williams
11:00 a.m.	“Investigating Irony: The Role of Speaker Identity”	“Potential mechanism of action of curaxin against cancer by bioinformatics analysis”	“Psychological ownership and stewardship of nonprofit organization”
	Jack Rosner, Emily Novick, Jon Harewood, Caitlin Mahland	Kaitlin Accardi, Rochelle Ratner, Nushe Hasanramaj, Ariana Nurse, Isaac Sadykov	Germaine Nishimirwe
11:20 a.m.	“Covid- 19 Stress and Weight Gain”	“GAD67 Expression in the Piriform Cortex of Cntnap2 Mice”	“Impact of Authoritarian Parenting Style in Chinese American Children”
	Ashley Delbrune, Brian Siuni, Gideon Lim	William Shin, Yamini Nori, Himani Jani, Aaron Miller, Mac Josh Reandelar, Aidan Papalia, Brianna Yaeger, Violeta Roumenova, Kimberly Fasciglione	Ka Wai Wen
11:40 a.m.	"The Impact of Sound on Mood Memory and Problem Solving Ability"	“Effects of knocking down AMPK α Subunit Isoforms on Doxorubicin Cytotoxicity in H9c2 cardiomyoblast cells”	“Esmeralda Santiago: Life and Work”
	Marissa Karasz, Ryan Arroyo, Devin Delvalle	Anoushka Guha, Pooja Jaiswal, Tint Tha Ra Wun, Akito Nicol, Mandeep Singh, Jaclyn Del Pozzo, Puja Mehta, Tamayo Kobayashi	Karibay Angeles
12:00 p.m.	“Category & Audience Design”	“Predicting the masses of subatomic particles using string theory”	“Health Policy Brief: The Cannabidiol and Marijuana Research Expansion Act (S.2032) and Medical Marijuana Research Act (H.R.3797)”
	Matthew Renz, Brandon Fanizza, Serena Sukhandan, Kyle Spiegel, Stuti Shah	Patrick Mazza Trinh La	John Purcell

<p>12:20p.m.-2:40p.m.</p>	<p>Room 1 Moderator/Host: Nicole Calma-Roddin Melissa Huey</p>	<p>Room 2 Moderator/Host: Randy Stout Pejman Sanaei</p>	<p>Room 3 Moderator/Host: Michael H. Amanda Golden</p>
<p>12:20 p.m.</p>	<p>“The Impact of Remote Learning on Mindfulness and Engagement”</p>	<p>“Analysis of the Relationship between Geographical Location and Genetic Diversity of Phages that Infect the Genus Arthrobacter in the US”</p>	<p>“Characterization of Bone Morphology Preserved with Different Fixatives Using a MicroCT Scanner”</p>
	<p>Marissa Karasz, Zenab Shafiq</p>	<p>Nayan Pallothu</p>	<p>Lina Elkoulily, Cagri Senlik</p>
<p>12:40 p.m.</p>	<p>“How Race Influences Perceptions of Crime”</p>	<p>“Emotional Intelligence and Stress: Potential Impacts on Academic Performance and Medical Boards Licensing Scores”</p>	<p>“Using Ozobot in classroom”</p>
	<p>Joseph Keller, Aracelis Genao, Ryan Decristoforo, Genesis Benitez</p>	<p>Katherine Keever, Risa Kiernan</p>	<p>Betsy Karukamalil Joy, Davinder Kaur</p>
<p>1:00 p.m.</p>	<p>“Video Games and Nutrition”</p>	<p>“Accelerating Systemic Addiction Recovery Using Dosed Exercise”</p>	<p>“Analysis of Eye Fixations During Emotion Recognition in Talking Faces”</p>
	<p>Kamille Williams, Evangelia Tsagaris, BinCheng Wang</p>	<p>Deena Albert, Kelly Borges</p>	<p>Callyn Villanueva</p>
<p>1:20p.m.</p>	<p>“Correlation Between Physical Cues and Comfortability Participating In an Online Environment”</p>	<p>“Flow and Fouling in a Pleated Membrane Filter”</p>	<p>“Youth Involvement and Participation in the 2020 Myanmar Elections”</p>
	<p>Carmine Velez, Deb Preom</p>	<p>Dave Persaud</p>	<p>Tint Tha Ra Wun</p>

1:40 p.m.	"Intellect VR: Learning in VR; the VR Experience in the Classroom"	"Examining Pleated Membrane Filter Performance Based on Pleat Packing Density and Cartridge Geometry"	"Assessing the applicability of Kevin Lynch's framework of "The Image of the city" in the case of New York City."
	Bendangtoshi Tiajungla Dominica Jamir	Mikhail Smirnov	Jay Patel
2:00 p.m.	Can Photo Arrays With Crime Scene Backgrounds Impact Criminal Identification?	"On mathematical modeling of erosion and deposition in flow networks"	"HEALTH POLICY RESEARCH: The Marijuana Opportunity Reinvestment and Expungement Act (MORE Act; H.R. 3884)"
	Kevin Narine, Ryan Murphy, Angelica Mei, Brian Smith	Hamad El Kahza	Tija Passley

POSTER PRESENTATIONS

Room 1

Moderators/Hosts: Elizabeth Donaldson, Amanda Golden

"Social, political, life-style themed poster"	Afrika Conteh
"Teens and Social Media"	Stacie Kiriazis
"Get your own Hobby! Why consumers' hobbies elicit territorial behaviors during the COVID-19 pandemic"	Saniya Ratnani
"How to Efficiently Simulate Granular Materials: From Cell Membranes to Sand"	Samantha Rivera
"Smoking Infographic"	Philip Cohen
"Be the solution, stop pollution"	Meghan Jansen
"Childhood Cancer In The United States"	Annette Pavlakis
"Waste Management"	Manpreet Hanspal, Akshita Rathore
"Problems of Healthcare in the United States"	Bolun Zhang

POSTER PRESENTATIONS

Room 2

Moderators/Hosts: Reza Amineh, Randy Stout

"Common comorbidities in COVID-19 patients associated with ICU admission and mortality at Saint Catherine of Siena Medical Center"	Sebastian Geraci, Justin Newman
"Determination of Cardiac Risk Factors in Trauma Patients May Yield Insight Into Improved Care"	Richard LaRocco, Scott Livitz, Stephanie De Mel, Taner Celebi, Dana Schulz
"Can Artificial Intelligence Assist Surgeons in Identifying Landmarks In Laparoscopic Cholecystectomy Surgery?"	Matthew Brett
"Towards early detection of Cervical cancer"	Krushang Kamleshkumar Pandya, Caroline Fernandez, Tanvi Patel, Brian Siuni, Sai Srija
"Astrocyte Connexin43 Localization is Altered by Potential Therapeutic Compound in a Mouse Model of Autism"	Kimberly Fasciglione, Mac Josh Reandelar, Violeta B. Roumenova, Aaron T. Miller
"Does Personality Type Influence Medical Specialty Selection?"	Dana Schulz, Emily Dries
"The Effects of 3D Printed Cell-laden Strontium-doped Alginate-Collagen scaffolds on Osteoblast Behavior"	Shebin Tharakan
"Peritoneal Dialysis Location of Training on Peritonitis Rate"	Mallika Chauhan
"Effect of Eccentricity in Microwave Imaging of Multiple Composite Pipes"	Yuki Gao, Noshin Raisa
"Functional Outcomes in Patients Receiving Platelet-Rich Plasma (PRP) Injections Following Arthroscopic Repair for Meniscal and Rotator Cuff Tears: A Review"	Neil Gambhir, Forrest Butenksy, Hannah Fischer

POSTER PRESENTATIONS

Room 3

Moderators/Hosts: Bryan Gibb, Leonidas Salichos

"LJD Bacterial Growth Experiment: O.D V.S CFU (Manuel Ortiz Faculty Mentor: Bryan Gibb)"	Manuel Ortiz
"Physiological Stability of Shaolin, LKSleep and RW Phages"	Rahul Ubriani, Salman Khan
"Standardized method of photographing bacteriophage plaques"	Opong Bramble
"Does LK-Sleep give bacterial cells immunity against other phages? "	Elsy Ventura
"Functional Annotations"	Domenico Carroll, Yash Patel
"Phage- Where Form Follows Function"	Carly Zincone, Ioannis Daniil
"SOURCE Abstract"	Ann Zhang, Salvatore DeMartino
"Minor Tail Proteins in Bacteriophages"	Alessandro Drudi, Valerie Martinez
"Analysis of phage DNA extraction techniques "	Adnan Alladin

POSTER PRESENTATIONS

Room 4

Moderators/Hosts: Todd Cohen, Giovanni Santamaria

Evaluating human emotional responses to certain spatial forms developed in Virtual Reality to rationalize design decisions "	Aleksandra Zatorska
"Analysis of implications of toxicity and pollution associated with mineral oil explosion in high voltage T & D substations"	Ali Bahonar, Seyed Alireza Roknizadeh
"Did you know?"	Elise Park
"Istanbul - Site Investigation"	Stuart Jacome, Ariel Lorenzi, Antony Rosas, Eddy Voltaire, Elsie Torres
"Fosho Magazine- A Digital Lookbook"	Joshua Joseph
"The Hunts Point Collaborative Thesis: Understanding the site"	Francis Rodriguez, Marilyn Corea-Ramirez, Donald A. Costner JR, Joshua Kogut, Tiarnan Mathers
"Increase awareness of colorectal cancer in younger population: A case study highlighting 29 year old female presenting aggressive form of CRC"	Kriti Badola
"The Use of Virtual Reality in Medical Education"	Jerry Jose, Edward Piscitelli, Mohit Gogna
"Internally Validated Artificial Neural Network for Benchmarking Performance in an Urban Trauma Center "	Scott Kivitz, Dana Schulz, Stephanie De Mel, Sonia Amanat, Taner Celebi
"Conceptualizing Heart Disease through Art"	Jerry Jose

Analysis of phage DNA extraction techniques

Student Presenter: Adnan Alladin

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

When the word organism is mentioned, we tend to think of animals, plants, maybe even bacteria. However, the majority of organisms often go unnoticed. Bacteriophages are the most abundant biological organism on the planet, at an estimated 10^{31} bacteriophages. That means there are more phages than every other organism on Earth, including bacteria, combined! Despite the sheer abundance of phages, there is a lack of genomic data for these creatures. This gap in knowledge represents one of the largest reservoirs of genomic “dark matter” on the planet. Recent studies into this field have paved the way for revolutionary scientific advancements, such as CRISPR technology, for which phage genes were critical in its development. As scientists enter these new frontiers, isolating new phages which have genes with no known function, genomic sequencing becomes a primary objective. Thanks to recent advances in DNA sequencing technology, the cost of sequencing genomes has been greatly reduced. It has also become easier to sequence new genomes. There are different sequencing technologies that can be rather sensitive to DNA purity and integrity. We want to optimize a pipeline for sequencing bacterial and bacteriophage genomes using both Illumina and Oxford Nanopore sequencing technologies. To do this we are testing a variety of DNA isolation and purification protocols and kits to determine how to collect high quality data while minimizing cost and labor involved in preparing samples.

Social, political, life-style themed poster

Student Presenter: Afrika Conteh

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art & Design

School/College: College of Arts and Sciences, New York

Wildlife crime is a substantial industry ran by malicious international networks. Animal anatomy are trafficked in a similar fashion to drugs and weapons. Some claim its purpose are medicinal but that has since been invalidated. The project is set out to address the illegal wildlife trade on rhinos and elephants. Although there are countless other species that are similarly overexploited, from marine turtles or tigers, my focus was on the most endangered animals. Eliminating wildlife crimes should be a priority as it is a major threat to the world's most threatened species, second only to environmental destruction.

Evaluating human emotional responses to certain spatial forms developed in Virtual Reality to rationalize design decisions

Student Presenter: Aleksandra Zatorska

Faculty Mentor: Randy Stout, Marcella Del Signore

Department: Biomedical Science; Architecture & Design

School/College: School of Architecture and Design, New York

About 5.2 million people suffer from Post-Traumatic Stress Disorder (PTSD) per year, and an estimated 7.8 million Americans will experience PTSD at some point in their lives. The purpose of this project is to raise awareness of the presence of trauma, show the potential use of VR in architectural research and explore the connectivity between neuroscience, architecture, and healing processes. The architectural space proposal developed for the Architectural thesis studio scrutinizes various interactions between human body and spatial forms, as well as the way of releasing the patterns held in the body after experiencing traumatic event or long-term stress. The project has two intersecting tracks that are developed simultaneously. The first is the development of a VR study to scrutinize emotional and physical responses through interactive surveys of the participants being immersed with certain architectural characteristics. The results will serve as a data layer to allow me to identify the spatial characteristics that were shown to have an effect on the study participants during the VR experimentation so that we are able to add rational design elements as components of an overarching functional pavilion design for those with PTSD. The main project environments are also defined by the information extracted from the literature recommended by Academy of Neuroscience for Architecture and body techniques that lead to calm and relaxation.

Minor Tail Proteins in Bacteriophages

Student Presenter: Alessandro Drudi, Valerie Martinez

Faculty Mentor: Bryan Gibb, Leonidas Salichos

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Minor tail proteins play an important role in tail assembly of bacteriophages. A bacteriophage is a virus that infects bacteria. Each type is specific for a single bacterial species virus. Bacteriophages destroy their host cells and when they attach to a bacterial cell. Phage tails are constructed from repeating subunits of tail proteins. Some minor tail proteins have enzymatic activity and it helps the phage recognize the correct host, get through the cell surface, or through the cell wall to inject the DNA. The phage we are exploring is called Eraser which affects *Arthrobacter Globiformis*, a soil-dwelling non-pathogenic bacteria. Phage Eraser was isolated by NYIT students outside of Theobald Hall and characterized and sequenced. We are doing a genomic analysis of the bacteriophage using a number of bioinformatics tools. Using the gene exploration tool Phamerator as well as databases like PhagesDB, we were able to identify the functions of many of the genes in Eraser, including those coding for tail proteins. These tools also allowed us to compare the genes in Eraser with other related bacteriophages and see that these regions are highly conserved among closely related bacteriophages. In conclusion, the use of functional prediction using computational tools is important because you can quickly get a functional characterization for a specific genomic region.

Analysis of implications of toxicity and pollution associated with mineral oil explosion in high voltage T & D substations

Student Presenter: Ali Bahonar, Seyed Alireza Roknizadeh

Faculty Mentor: Patricia Keen

Department: Energy Management

School/College: College of Engineering and Computing Sciences, Vancouver

The provision of electricity for today's society works in the same way as the circulation of blood in our bodies. Transmission and distribution (T & D) of electricity are impossible without the high voltage T & D substation that performs the analogous function as our heart. Just as blood pressure and blood lipid concentrations have risen in our hearts due to our contemporary lifestyle, the pressure on electricity substations has risen day by day in an equivalent fashion. This stress of thirsty energy consumption has put more pressure on the electrical T & D systems, but it is also accompanied by ambient temperature increase. The risk of explosion of power transformers and electrolyte capacitors is one of the increasing pressures linked to the substation's equipment. This paper will describe the implications of toxicity and pollution associated with high voltage T & D substations on water resources and soil in the receiving environment. The present article will also discuss this risk of explosion as it has many accompanying environmental impacts, including soil, air, and water pollution due to complete and incomplete burning of cellulose paper, mineral oil burning, and ignition by-products of other substations equipment.

SOURCE Abstract

Student Presenter: Ann Zhang, Salvatore DeMartino

Faculty Mentor: Bryan Gibb, Leonidas Salichos

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Bacteriophages are recognized as the most abundant agents on Earth that infect and replicate only within bacterial cells. DNA Master is a genome annotation program that shows us phages at the gene level and we often utilize this to research their functions. Unlike other organisms, bacteriophages genomes are densely packed with genes due to space restrictions in the capsid, so it is unusual to find large regions of DNA that do not code for proteins in bacteriophages. Computational methods such as Glimmer and GeneMark provide automated gene predictions to give us a sense where each gene begins. Using these tools we can then calculate the gaps and overlaps between one gene's end and another's start. We noticed that Phage Eraser has a gap between Genes 42 and 43. A similar situation is also observed in evolutionarily similar phages such as Elizi, Phives, YesChef. Here we investigate this non-coding region for potential coding signals and characterize the surrounding genes. Bioinformatics plays an important role not only when exploring coding, but also when predicting non-coding or unknown regions as well.

Childhood Cancer In The United States

Student Presenter: Annette Pavlakis

Faculty Mentor: Patty K. Wongpakdee

Department: Graphic Design

School/College: College of Arts and Sciences, Long Island

Childhood cancer is prevalent all throughout the United States. Children are being diagnosed daily, some children won't make it until the end of their fight, and there are multiple effects from treatment to face after being cured. Some cancers have higher survival rates than others depending on the type of cancer and the stage it is in. DIPG has the lowest five year survival rate (2%) and Wilms Tumor has the highest (91.3%). No one is considered fully cured until they reach the five year mark without any evidence of disease. I am using my design skills to indicate the different types of childhood cancers and the effects they have on children by showcasing it in an infographic poster.

Effects of knocking down AMPK α Subunit Isoforms on Doxorubicin Cytotoxicity in H9c2 cardiomyoblast cells

Student Presenter: Anoushka Guha, Pooja Jaiswal, Tint Tha Ra Wun, Akito Nicol, Mandeep Singh, Jaclyn Del Pozzo, Puja Mehta, Tamayo Kobayashi

Faculty Mentor: Satoru Kobayashi, Qiangrong Liang

Department: Biology- BS/DO

School/College: College of Arts and Sciences, New York/Long Island

Doxorubicin (DOX) is an anthracycline drug widely used in cancer treatment which can cause dose-dependent cardiotoxicity, culminating in heart failure. AMP-activated protein kinase (AMPK) is a key regulator of cellular metabolic processes which has alpha, beta, and gamma subunits. While the molecular mechanisms of DOX cardiotoxicity remain unclear, AMPK has been suggested to protect against DOX cardiotoxicity. In this study, we investigated the effects of knocking down the AMPK α subunit isoforms on DOX cardiotoxicity. We transfected H9c2 cardiomyoblasts with siRNA to knock down the $\alpha 1$, $\alpha 2$, or both subunits and then treated the cells with DOX. Cell death was measured using propidium iodide (PI) staining and Western blot analysis of the expression of cleaved caspase-3. Surprisingly, the concurrent knockdown of both $\alpha 1$ and $\alpha 2$ isoforms reduced DOX-induced cell death as confirmed by decreased PI-positive cell count and cleaved caspase-3 expression, suggesting that AMPK contributed to rather than protected from DOX cardiotoxicity, in contrast to previous results. Interestingly, the knockdown of only $\alpha 1$ decreased cell death to the same degree as knocking down both $\alpha 1$ and $\alpha 2$ isoforms, while $\alpha 2$ knockdown had minimal effect on DOX cardiotoxicity. These results suggested that the $\alpha 1$ and $\alpha 2$ isoforms of AMPK played different roles in DOX cardiotoxicity and that strategies targeting AMPK for treating DOX cardiotoxicity should consider the isoform specific effects of the α subunit.

Covid- 19 Stress and Weight Gain

Student Presenter(s): Ashley Delbrune, Brian Siuni, Giddeon Lim

Faculty Mentor: Melissa Huey

Department: Behavioral Sciences

School/College: College of Arts and Sciences, Long Island

COVID-19, also known as the coronavirus pandemic, was first identified in December of 2019(www.cdc.gov/coronavirus/2019-ncov/cdcreponse/about-COVID-19.html). Given the novelty of the virus, many did not understand the severity of the virus and the impact it would have on our nation in the months to come. COVID-19 is a pandemic that puts a strong toll of stress along with weight gain on many young college students(www.wsj.com/articles/remote-learning-during-covid-19-is-causing-children-to-gain-weight-doctors-warn-11613298602). Due to quarantine and the separation amongst fellow classmates and what we would consider as a normal college experience, students may be experiencing increased stress and weight gain during this time period.

The purpose of our research is to examine different college students from different universities' stress levels and weight gain during the COVID-19 pandemic. Due to the confines of being able to go to public spaces and socialize, it is likely that college students are experiencing increased stress, which is associated with increased weight gain. We will be recruiting students to take place in a short survey that is related to stress and weight gain, prior and post COVID- 19 pandemic. By the end of this research study, we expect to find a better understanding on why COVID-19 impacted stress and weight gain on college students, and how they are able to recover. We are looking to recruit college students from New York to conduct a short survey in gathering information to help us better understand the impact that COVID-19 had on college students in terms of stress and weight gain.

Intellect VR: Learning in VR; the VR Experience in the Classroom

Student Presenter: Bendangtoshi Tiajungla Dominica Jamir

Faculty Mentor: Sung Kevin Park

Department: Digital Art and Design

School/College: College of Arts and Sciences, New York

Note: Oral presentation and live VR demonstration

My Virtual Reality (VR) project was approached with the intention to use this technology as an effective tool to enhance teaching and learning methods through immersive and activity-based experiences. Professors, in addition to their traditional teaching methods, use a web-based platform to enhance the lessons by adding 3D visualizations in the VR system.

Students after logging in, immerse themselves in VR on topics such as learning the structure of molecules. In VR, molecules can be viewed as larger than life 3D models. Minute details are enlarged for clarity and certain sections of a molecule are clickable to obtain additional information. The molecule can also be rotated to provide 360 degree views.

Students immersed in VR, experience molecules in depth, and visualize the professor's lesson taught earlier. Each molecule "lesson" comes with its own set of multiple choice questions. Each optional choice answer has a button which records responses and provides a total score at the end of the quiz. Upon completion of a lesson and quiz, students can choose to continue on to the next lesson or opt to "look around" the VR space to see what lessons are available. Students will then see rotating molecules with respective lesson names to choose from.

My vision is to continue to improve this VR learning experience and make it accessible to students with different physical abilities and learning styles.

Using Ozobot in classroom

Student Presenter: Betsy Karukamalil Joy, Davinder Kaur

Faculty Mentor: Gregory Gerber

Department: Instructional Technology

School/College: College of Arts and Sciences, Vancouver

Students need to learn 21st-century skills such as critical thinking, collaboration and the ability to interpret and analyze to thrive in today's world. Steam/stem education implements project-based learning where educators and students develop critical thinking and problem-solving skills. One of the innovative tools that can be used in this constructivist approach is Ozobot. This is a tiny robot that ensures the engagement of students in learning. The Ozobot can be programmed in two ways. The first method uses colour codes; the Ozobot will follow the instructions and perform tasks according to colour codes. The second method is Ozoblockly coding; this is completely programming. This project explores how ozobot will work with colour codes and ozoblockly codes to do several activities in STEAM.

Problems of Healthcare in the United States

Student Presenter: Bolun Zhang

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art & Design

School/College: College of Arts and Sciences, New York

Hello everyone, my name is Bolun Zhang. I'm a senior Graphic Design student from Beijing, China. Through learning graphic design, I realized that an infographic could convey a lot of effective information. For this social issue poster, I chose to do "Problems of Healthcare in the United States." The health care system in the United States has big financial problems. Most hospitals in the United States are private, regardless of local government ownership. According to the CDC, "per capita national health expenditures: \$11,172 (2018)," "total national health expenditures: \$3.6 trillion (2018)," "percent of national health expenditures for hospital care: 32.7% (2018)," and "percent of national health expenditures for prescription drugs: 9.2% (2018)." From the above four points, it can be seen that the American people spend a considerable amount of money on health care. According to the "Health System Tracker," in the United States, individuals spend twice as much on health care as individuals in other developed countries, which is \$10,966 per person. Moreover, according to an article by Kate Tuttle, published on Perficient, The United States has the lowest average standard of health care, but the highest prices. The U.K has the highest average health care and the lowest prices of any developed countries. Lastly, according to the Health System Tracker, "the United States private and public health expenditures total is over 16% of GDP. In a word, people will inevitably get sick. America's expensive health care system will make it impossible for Americans to live a normal life.

Analysis of Eye Fixations During Emotion Recognition in Talking Faces

Student Presenter: Callyn Villanueva

Faculty Mentor: Houwei Cao

Department: Computer Science

School/College: College Engineering & Computing Science, New York

The study of emotion recognition undoubtedly has an exciting future. Numerous researchers have made advances in the field; from analyzing facial expressions, body gestures and extracting speech features in hopes to improve the process of identifying human emotion. In this study, we explore subjects gaze patterns when identifying six universal emotions on videos of expressive talking faces in efforts to apprehend the impact of audio-visual channels on gaze behavior & perception. Stimuli for this experiment consists of carefully selected actor videos and audio from the Crowd-sourced Emotional Multimodal Actors dataset. The experiment consisted of two sessions (first session was sequential with 36 trials and second session was randomized with 36 trials) making a total of 72 trials. The participants' eye movements were recorded by using the Tobii Pro Nano eye-tracking system. We defined a set of area of-interest (AOI) regions consisting of 7 AOIs of general face areas and 15 AOIs related to specific Action Units (AUs) involved in the coding of the six basic emotions. Our findings show that participants overall response accuracy to an emotional facial expression was 79.2%. The random session had an accuracy of 80.5%, which was higher than sequential (77.8%). We also ran ANOVA tests to see differences in fixation time of AOI in different groups. We have found significant differences of a subset of AOI's across 6 emotions as well as Positive, Negative & Neutral groups. We also see significances in the fixation time of AOI's in Congruent, Incongruent Natural & Incongruent Synthetic groups.

Phage- Where Form Follows Function

Student Presenter: Carly Zincone, Ioannis Daniil

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Engineering and Computing Sciences, Long Island

Bacteriophages are viruses that only kill and selectively target specific bacteria. Students at NYIT isolated bacteriophages that infect *Arthrobacter globiformis*, a soil-dwelling, non-pathogenic bacterium as part of a research class. Phage Eraser was found in soil near Theobald Hall, and had its genome sequenced. Using computational programs to analyze the genome of phage Eraser, we predicted genes were predicted by Glimmer based on coding potential and 71 genes confirmed by human verification. Then, we used phamerator when identifying the position and length of each gene, their protein function (if they had one) and the overall comparison of other phages from the same cluster. Using HHpred and NCBI databases we were able to determine that gene 3 was a Portal protein, and gene 7 was a Major capsid protein. By examining these genomic regions in similar phages, we detected high genetic similarity suggesting that many other phages have these genes. The Major Capsid Protein provides the initial interaction site of the viral particle with the host cell whereas the portal protein is responsible for forming a bidirectional passage of viral DNA which can move in and out of the virus head. Although they are not initially related to one another, they are interdependent and reliant on one another. These are essential proteins found in nearly all phages, with genes that are highly conserved in other related phages in the cluster. Further in vitro research can confirm the function of these proteins

Correlation Between Physical Cues and Comfortability Participating In an Online Environment

Student Presenter: Carmine Velez, Deb Preom

Faculty Mentor: Melissa Huey

Department: Psychology

School/College: College of Arts and Sciences, New York

The recent transition from in-person classrooms to a fully remote learning environment has created concerns about the effectiveness of online learning. With this, one of the major concerns is a lack of engagement from students which in turn, can cause a lower quality of education. A study from June of 2014 provides evidence that a teacher's use of physical cues, such as eye contact, correlates with the performance of students (Atta & Ayaz, 2014). The use of video chat to communicate changes the way students can interact with one another, with reduced opportunity to read others physical cues such as eye contact, hand raising, and posture. These physical cues have been categorized to measure the impact of such nonverbal behavior in communication (Mehrabian, 1968). This study will be used to determine if students feel a lack of physical cues and how this correlates with the student's level of comfortability participating in online classrooms. College students at New York Tech will be asked to take a survey asking about their perception of physical cues in a traditional classroom environment versus an online environment. We hypothesis that students will recognize a lack of physical cues in an online environment, and that this will correlate with a lack of comfort and engagement in the classroom.

Increase awareness of colorectal cancer in younger population: A case study highlighting 29 year old female presenting aggressive form of CRC

Student Presenter: Criti Badola

Faculty Mentor: Paul Cohen

Department: Family Medicine

School/College: College of Osteopathic Medicine, Long Island

Colorectal cancer (CRC) is the third most common cancer and cause of cancer death worldwide in both genders. Despite the prevalence of screening tests such as fecal occult blood test (FOBT) and colonoscopies allowing for early detection, deaths among people younger than age 55 have increased 2% per year from 2007-2016. While the overall frequency of CRC has been declining, early onset CRC continues to rise representing a population of patients with unmet clinical needs. By the year 2030, the incidence of colon cancer is expected to double and rectal cancer incidence is expected to quadruple from 11% and 18% respectively. Although some cases may have a hereditary basis, the majority appear to arise sporadically. Needless to say, this presents a serious threat to our healthcare system; this prompted the American Cancer Society (ACS) to change its recommendation from age 50 to age 45 for people at average risk in 2018. Currently routine colonoscopy is not recommended for individuals younger than age 45, resulting in advanced stages of colorectal cancer especially when diagnosed before age 20. In this report, we describe 1 case diagnosed with colorectal adenocarcinoma at age 29. With this brief case review we would like to emphasize the alarming rise in the incidence of early onset colorectal cancer, and the importance of raising awareness and creating newer guidelines in response to the changing demographic of patients impacted by CRC.

Does Personality Type Influence Medical Specialty Selection?

Student Presenter: Dana Schulz, Emily Dries

Faculty Mentor: Catherine Tolvo

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Background: To compare medical specialty choice, personality type using the Myers Briggs Type Indicator (MBTI) and burnout in men and women Osteopathic medical students.

Methods: NYIT IRB approval was obtained. 66 fourth year medical students completed the email survey and were analyzed. Data collected included demographics, career goals and MBTI personality questions. Personality type was determined using a MBTI questionnaire. Data and statistics were analyzed utilizing JASP v.0.14.1.

Results: 68.2% of Medical students were extroverts (E), v. 31.8% introverts (I); 69.7% Intuitive (N) v. 30.3% Sensing (S); 71.2% Feelers (F) v. 28.8% Thinkers (T); and 75.8% Judging (J) v. 24.2% Perceiving (P). The most common types were ENFJ (28.8%), ESFJ (10.6%), and INFJ (9.1%). Students matching to medical fields were more likely to be Feelers, while those who matched into surgical fields were more likely to be Thinkers ($p=0.025$). Male students had higher "T" tendencies (%T=51.1%) while female respondents skewed towards "F" (%F=59.1%) ($p=0.002$). There were no statistically significant differences between personality type and entering a high vs. low burnout field.

Conclusion: Overall, medical students' personality types differ from those of the general population and, at least in part, define their professional choices. Use of personality types may be important in medical curriculum and burnout studies among physicians.

Flow and Fouling in a Pleated Membrane Filter

Student Presenter: Dave Persaud

Faculty Mentor: Pejman Sanaei

Department: Mathematics

School/College: College of Engineering and Computing Sciences, New York

Pleated membrane filters are essentially thin sheets of porous media sandwiched between two support layers, all of which are housed inside of a cylindrical cartridge. They are in widespread industrial use, since they offer a superior surface area to volume ratio in comparison to equal-area unpleated membrane filters. However, their performance characteristics are inferior to those of flat sheet media. We developed a simplified mathematical model, which accounts for the pleated membrane geometry as well as two mechanisms of fouling: (i) adsorption of small particles within membrane pores and (ii) blocking of entire pores by large particles. Using asymptotic analysis based on the small aspect ratio of the pleat, we simplify our model and compare the obtained results to those of equivalent flat sheet media filters.

Accelerating Systemic Addiction Recovery Using Dosed Exercise

Student Presenter: Deena Albert, Kelly Borges

Faculty Mentor: Dr. Sidra Ghafoor

Department: Osteopathic Medicine

School/College: College of Osteopathic Medicine, Long Island

In 2018, approximately 20.3 million Americans aged 12 or older reported suffering from substance use disorder (SUD) related to their use of alcohol or illicit drugs in the past year. It is imperative that we remember that addiction is treatable, and recovery is possible. Our nonprofit Fitness In Recovery proposes the implementation of dosed group exercise programming across clinical, collegiate, and community settings. Based on the abundance of evidence supporting the therapeutic role of exercise in mental illness, we posit uniquely-delivered group exercise programs have the potential to accelerate systemic addiction recovery by collectively improving multiple health domains adversely affected by addiction (e.g. sleep, cognitive function, mood). Mechanistically, we hypothesize dosed exercise elicits specific neurotransmitter responses associated with addiction recovery, thereby alleviating and potentially reversing the hedonic deficit underlying the physiology of addiction relapse. Preliminary data from our pilot program at an intensive outpatient recovery center in Philadelphia supports the role of group exercise for improving symptoms of depression and anxiety. We aim to expand our studies through clinical trials in the community, designed with critical input from experts in the fields of addiction medicine, psychiatry, neurology, and exercise physiology.

Functional Annotations

Student Presenter: Domenico Carroll, Yash Patel

Faculty Mentor: Bryan Gibb, Leonidas Salichos

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Bacteriophages are specialized viruses that attack specific bacteria. In past years, more attention and research have been given to phages, as the effectiveness of antibiotics decreases, phages are a viable alternative as they do not harm human cells. As the most abundant biological entity on the planet, you can find them just about anywhere. Like all biological entities, phages have genomes. For phages to be viable alternatives to antibiotics, we have to be able to read and understand their genomes through genome sequencing. Genome sequencing has many subparts to it, most notably annotating the genome and its function. Annotating the genome reveals the structure of the genome and how many genes it has, whereas annotating the function reveals that gene's impact on the organism. Using DNA Master, PhagesDB and Phamerator allowed us to both annotate and characterize the different genes in the phage Eraser. Eraser infects *Arthobacter globiformis*, which is a soil-dwelling non-pathogenic bacteria. By implementing an automated gene annotation, we identified 71 genes in Eraser. Here, we present our annotation process resulting in the functional characterization of genes 36, 37, and 38 using computational tools. We compared this region of genes to other genes of the same cluster, AZ. Gene 36 is a Holliday Junction Resolvase, Gene 37 does not have any function and Gene 38 is DNA primase/helicase. We wish to explore why a gene with an unknown function comes between these two functions.

Did you know?

Student Presenter: Elise Park

Faculty Mentor: Andreas Tjeldflaat

Department: Architecture and Design

School/College: School of Architecture and Design, Long Island

In New York City, nearly 1 in 106 people are homeless. 61,000 people find themselves without shelter each day, and lack basic and fundamental human needs. The stigma around people who find themselves without homes has been perpetuated in an extremely dangerous way, and is something that necessitates a deep communal shift. By viewing housing as a mere financial asset instead of considering it a deeply rooted primitive human right creates a damaging narrative about the right to shelter.

The "Did You Know?" project strives to begin constructing a new and more optimistic narrative about homelessness. It aims to map out businesses that want to help, including bakeries, grocery stores, nonprofit organizations, law firms and more, to create a resource for the homeless to utilize, and for the community to be better aware and more understanding of the epidemic at large. This will create and foster meaningful relationships between local businesses and those that need help. The preliminary focus of this project will be in the neighborhood of Bushwick, Brooklyn, which experiences some of the highest rates of homelessness in New York City.

Architecture and design cannot "fix" the problem of homelessness without the full awareness, understanding and help of the communities it attempts to alleviate. By striking up a conversation between neighborhoods and their homeless neighbors, we can begin to construct a positive narrative and show that we are not, in fact, so different after all.

Does LK-Sleep give bacterial cells immunity against other phages?

Student Presenter: Elsy Ventura

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Bacteriophages are viruses that infect and kill bacterial cells. Phages are specific for the bacteria they infect, often infecting a single species or even a subset of strains. Phages consist of nucleic acid DNA or RNA enclosed in a protein shell called a capsid. A phage infection can proceed through one of two lifecycles, lysogenic or lytic. The lytic cycle is when the virus replicates in the host and the newly formed phage particles are released when the host cell bursts. During the lysogenic cycle, the phage injects its genome into the bacterium and it is inserted into its chromosome. Every time the bacterial cell divides, the daughter cell inherits a copy of the phage. A lysogenic bacteriophages can resume lytic growth stochastically or based on exogenous triggers. Phages LK-Sleep, Shaolin and RW form hazy clearings called plaques when infecting the host bacterial strain. This suggests that these phage do not completely kill the bacteria and may be entering the lysogenic cycle. We set up infections to isolate stable lysogens with each of the three phages. The lysogens with LK-Sleep and Shaolin were then able to resist infection challenges from each other because they are closely related, but was susceptible to infection from a more distantly related phage, RW. This study will allow us to see if a temperate phage can give a bacterial cell immunity to other phages. We will be able to see if temperate phages give bacterial cells an advantage illustrating how bacterial cells.

The Hunts Point Collaborative Thesis: Understanding the site

Student Presenter: Francis Rodriguez, Marilyn Corea-Ramirez, Donald A. Costner JR, Joshua Kogut, Tiarnan Mathers

Faculty Mentor: Giovanni Santamaria

Department: Architecture and Design

School/College: School of Architecture and Design, New York

This video is the first part of a year-long collaborative B.Arch thesis project at New York Tech. It focuses on the Bronx- Hunts Point- NY, framing and summarizing issues and potentialities with a crossing scales perspective that investigates historical, environmental, economic, political, social dynamics, to better understand the current state. This becomes the premise for sustainable design strategies and resilient approaches. With this research during the spring semester, we aim to address possible solutions to improve the quality of space and life for the local community in the future. The data collected, integrated, and cross-compared in this work is represented through multilayered mapping systems and experimental diagramming, towards the understanding of mutual connections and looking for the origin of the issues, more than their effects. Political unbalances, lack of social justice, unsustainable consumption, unequal distribution of powers, resources, and access to services across several scales are some of the factors that emerged from our research. The striving toward the achievement of a true Democracy comes with more prosperous economies, which contribute to both larger amounts of production and waste that have to be wisely managed. There is also a strong connection between marginalized groups and access to adequate health and education systems. To have a healthy community, there must also be a balanced and healthy environment.

<https://youtu.be/KkLQSCY5-uY>

Psychological ownership and stewardship of nonprofit organization

Student Presenter(s): Germaine Nishimirwe

Faculty Mentor: Colleen Kirk

Department: Management

School/College: School of management, Long Island

Working with Custom Collaborative, a nonprofit organization based in New York that organizes programs to train and support women from low-income and immigration communities to launch fashion careers and businesses, a method to influence "psychological ownership" towards their potential donors for the spring donation campaign was implemented. Running AB Testing, two different newsletters are to be sent out to two different groups of donors throughout the campaign. One group receives newsletters with words such as Donate to YOUR Custom Collaborative tailored to trigger the feeling of ownership towards the nonprofit while another group receives newsletters with simple messages encouraging donors to donate to Custom Collaborative as usually done every campaigning season.

The expected results are an increase in clicks on the emails and an increase in donations from the group that is receiving encoded newsletters.

On mathematical modeling of erosion and deposition in flow networks

Student Presenter: Hamad El Kahza

Faculty Mentor: Pejman Sanaei

Department: Mathematics

School/College: College of Computing and Engineering Sciences, New York

Erosion and deposition, in the environmental context, is represented as the evolution of solid bodies due to the forces exerted by the fluid or air on the contact surface, which both often lead to reconfiguration and change of the topology of the geological structures and porous media. These processes are notably very complicated and challenging to study in reality. In this work, we formulate novel and idealized mathematical models to examine the internal evolution of flow-networks in the setting of cylindrical channels, undergoing a unidirectional flow, by using asymptotic and numerical techniques. Starting from the Stokes equations combined with an advection-diffusion solid transport, we propose a model to construct a complete analysis of both the erosion and deposition in geological structures and porous media. The considered approach is of the form of threshold laws: the fluid-solid interface erosion and deposition occur when the total shear stress is, respectively, greater and lower than some specific critical values, depending on the solid material. As a consequence of the erosion and deposition, the structure channels' radii expand and shrink, respectively. Throughout this study, we investigate the networks' evolution, which hinges on a parametric research on specific types of membrane properties and their influence on the reconfiguration regime within the channel.

Investigating Irony: The Role of Speaker Identity

Student Presenter: Jack Rosner, Emily Novick, Jon Harewood, Caitlin Mahland

Faculty Mentor: Nicole Calma-Roddin

Department: Behavioral Sciences

School/College: College of Arts and Sciences, Long Island

Irony is a nonliteral language that identifies a discrepancy between expectations and reality. Having context related to a speaker's personality or mood will affect how often people expect the speaker to be ironic. Students at NYIT will be the participants in this study. Participants will hear a recording of an auditory dialogue. The experimenters will give the participants some information about one of the speakers in the dialogue, such as that the speaker is funny. Eventually, the dialogue will reach a line that is presented in text with an unidentified speaker. Student participants will report which speaker they believe said this line. Specifically, choosing one speaker will make the sentence ironic, while the other speaker would say the line sincerely. This means that which speaker the participant chooses will reveal whether or not they interpreted the line of text as ironic or not. The conclusions lay in whether or not the context affects participants' perceptions of the text.

Assessing the applicability of Kevin Lynch's framework of "The Image of the city" in the case of New York City.

Student Presenter: Jay Patel

Faculty Mentor: Marcella Del Signore

Department: Architecture

School/College: School of Architecture and Design, New York

The research is focused on the perception of an image of a city. Perception of urban space is usually linked to a picture portrayal that consists of something to be seen, remembered, understand, and apply. For examining this research and its relevance in a different geographical and cultural contest, this study looks at an American city to assess the applicability of Kevin Lynch's framework and to try and find out whether the framework still holds. For this Research work, New York City was selected for the fieldwork and people's perception. A study of responses given by the people was thus carried out to fulfill the objectives of this study. Kevin Lynch's work and criticism was taken as a base and present-day study was done to understand city image. The city provided the exploration of varied learning and the extension to the framework by the perception of people. The categorization of the sample and the categorization of answers for analysis led to the inferences that were different from the expected learning outcomes. It further goes on to explore whether the imageability cities and their elements have any co-relation to the how space is perceived. And there is subtraction and/or addition to those elements from which city image is perceived and how it helps to understand and design and redefine urban spaces. Furthermore, urban - design prototype will be designed to assess its applicability in today's world through people's perception.

The Use of Virtual Reality in Medical Education

Student Presenter: Jerry Jose, Edward Piscitelli, Mohit Gogna

Faculty Mentor: Randy F. Stout

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

Virtual Reality (VR) is an innovative technology which allows a “hands-on” approach to learning which is impossible by traditional teaching media. The medical field has recently had a surge of VR applications developed to teach human anatomy and surgical techniques. In this presentation, we will be exhibiting three VR projects that were created to supplement and enhance Neuroanatomy and Osteopathic Manipulative Medicine (OMM) instruction.

Conceptualizing Heart Disease through Art

Student Presenter: Jerry Jose

Faculty Mentor: Todd Cohen

Department: Cardiology

School/College: College of Osteopathic Medicine, Long Island

Heart disease is the leading cause of death among men and women in the United States with over 655,000 Americans dying from it every year. With the number of deaths this high, it is evident that there needs to be a greater focus on preventive measures. Individuals and loved ones of those who struggle with heart disease need to be made aware of this problem and how it can be prevented. “Surviving and Thriving with Heart Disease” is an upcoming book by Dr. Todd Cohen that aims to educate those who struggle with heart disease, as well as their loved ones. This book educates readers on the basic anatomy and physiology of the heart, the risk factors associated with heart disease, the different types of heart diseases, and the appropriate prevention, treatment, and intervention methods.

I have created medically accurate drawings to give readers a better understanding of heart disease through visual representations. These illustrations augment the text by further showcasing the anatomy of the heart and how it can change under stressful conditions. Additionally, various treatments and interventions have been illustrated to give readers an idea of how the normal physiological function of the heart can be restored to almost baseline. I have also created the “Know your Numbers” and “Plan B” wallet cards for patients to record their health information and for healthcare providers to use during emergencies. Patients can currently create their own Surviving and Thriving Card at Dr. Cohen’s publicly available website: www.liheartrhythmcenter.com. All of this will provide individuals with an easy-to-read book filled with illustration to educate them on what it means to survive and thrive with heart disease.

Health Policy Brief: The Cannabidiol and Marijuana Research Expansion Act (S.2032) and Medical Marijuana Research Act (H.R.3797)

Student Presenter: John Purcell

Faculty Mentor: Joerg Leheste

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Jonesboro

Over recent years, the United States has experienced groundbreaking shifts in policy and public opinion regarding the use of marijuana and its compounds. With medicinal marijuana now legal in 33 states and three US territories, as well as adult recreational use in 15 states, a clash exists between state and federal law. Marijuana remains illegal at the Federal level under the controlled substances act, as a Schedule I drug. Limited data from research shows promise in its therapeutic potential to treat a range of disorders yet the Food and Drug Administration (FDA) has only approved four marijuana-derived drugs for specific uses. A lack of research and data on safety and efficacy can be attributed to the obstacles researchers are faced with when registering to study this Schedule I drug. These regulatory barriers have stunted scientific research and the development of new drugs. Bipartisan lawmakers from both the House of Representatives and the Senate recently introduced legislation to promote marijuana research and accelerate the development and FDA approval of new medications. The Cannabidiol and Marijuana Research Expansion Act (S.2032) and Medical Marijuana Research Act (H.R.3797) will primarily ease federal regulations researchers must adhere to. This Health Policy Brief explores the impact the bills would have on various stakeholders including those living with disease, researchers, clinicians, lawmakers and their constituents, as well as law enforcement. The Brief also examines the bills' potential impact on cannabis research and its clinical applications.

How Race Influences Perceptions of Crime

Student Presenter: Joseph Keller, Aracelis Genao, Ryan Decristoforo, Genesis Benito

Faculty Mentor: Andrew Costello

Department: Criminal Justice

School/College: College of Arts and Sciences, Long Island

Perception of race may affect how people define the motive and definition of a crime. This may be more pronounced for crimes involving deaths of human beings. For example, the Boston Marathon bombing was a tragic event that hurt many individuals and emotions drove people to believe the event was a terrorist attack. The Las Vegas shooting was another terrible incident where some people considered it to be terrorism while others considered it to be a mass shooting. The shooting at Stoneman Douglas High School in Parkland, Florida was officially classified as a mass shooting. How could similar shooting events involving the death of more than four people, possible motives related to hate group or terrorist ideology, and actions involving the injury and death of coworkers by firearms be perceived or defined differently? To answer this question, this study will look into whether perceptions of race will define an incident as either a mass shooting incident, terrorist attack, or workplace violence. Identical surveys will be given to college students about the same incident with the only difference being the photo and name of the offender. Students will classify the incident as a type of crime and answer other demographic questions in the hope of determining if race, gender, or ethnicity is a factor in perceptions of defining the criminal incident.

Fosho Magazine- A Digital Lookbook

Student Presenter: Joshua Joseph

Faculty Mentor: Alexander Root

Department: Anatomy-Biology

School/College: College of Arts and Sciences, New York

Fosho Magazine is a digital fashion photography look I started in 2019 that focuses on creative expression through fashion photography and art. I began by developing relationships and creating visual concepts with artists, musicians, designers, photographers and other creatives in my community. My goal is for Fosho to become a space committed to inclusion and connectedness in art and fashion. I hope to do this by creating visual art elegantly dealing with concepts like individuality, race and identity to leave behind for posterity. Fashion is a billion-dollar industry that is profiting off of BIPOC and members of the LGBTQ+ community without pouring back into those communities. By investing in a sustainable platform to showcase and preserve my culture and the culture of the communities that I am an ally to, I hope to make a powerful statement against the cyclical and exploitative nature of fashion.

Right now, we are hyper aware of the need for a shift in fashion-whether that be with the diversification of the runway and campaigns or a re-distribution of the wealth around the industry. We need to reassess what our idea of inclusivity and diversity is in a system of rapid cultural expansion. The whole idea is to make fashion and art feel more attainable for the average person, because when they feel included and accepted they feel visible. And everyone wants to feel visible.

Impact of Authoritarian Parenting Style in Chinese American Children

Student Presenter: Ka Wai Wen

Faculty Mentor: Jaime Martinez

Department: Interdisciplinary Studies

School/College: College of Arts and Sciences, New York

As children grow up, they are affected by two factors: nature and nurture. Nature involves the biological factors and other genetically inherited traits that help determine how your body and mind works. Genetics can influence not only diseases but increase in likelihood of certain mental illnesses and disorders. Nurture is the other factor that helps shape children as they grow such as one's environment, their upbringing, the bonds that form between their peers, parents, and exposure to new ideas.

For Chinese American children, nurture plays a big role in shaping who they become. In 2011, Amy Chua, an author and a professor in Yale Law school, popularized the usage of tiger moms and tiger parenting. Tiger parenting is the strict style of parenting that is believed to be a good way of disciplining and raising an obedient, hardworking child. In America, this style of parenting is discouraged and, in some cases, may be regarded as abuse. Chinese American children who undergo this type of childrearing may develop subconscious habits, mental illnesses and behaviors as a result of this form of treatment. This project will analyze Amy Chua's controversial novel, *Battle Hymn of the Tiger Mother*, her beliefs as a self-identifying tiger mom versus the complex perspective of children who grew up exposed to this form of parenting. As important as it is to acknowledge the historical and cultural relation to the tiger style parenting, it's also important to bring awareness to the negative mental effects that may surface as the child enters adulthood and become an obstacle for them in the future.

Potential mechanism of action of curaxin against cancer by bioinformatics analysis

Student Presenter: Kaitlin Accardi, Rochelle Ratner, Nushe Hasanramaj, Ariana Nurse, Isaac Sadykov

Faculty Mentor: Niharika Nath

Department: Biological and Medical Sciences

School/College: College of Arts and Sciences, New York

Cancer causes 10 million deaths worldwide annually according to the WHO. An anticancer candidate Curaxin CBL0137 has been examined against various types of cancers and is in clinical trials. One mechanism by which CBL0137 acts is via a chromatin remodeling complex with the FACT protein. CBL0137 causes FACT to be dispersed from transcribed regions and become trapped in other regions. CBL0137 can also activate p53, which is a tumor suppressor gene that controls the cell cycle by inducing CDK inhibitor p21. It is postulated that CBL0137 can potentially modulate other proteins and pathways for other possible disease treatments. Our objective is to find other transcription factors or P53-associated proteins that are modulated by CBL0137. We examined FACT-based studies in human or mice with CBL0137, identified Gene Expression Omnibus Datasets, performed analyses with untreated and treated datasets and identified a list of differentially expressed genes from a volcano plot. Statistically significant differentially expressed genes were then analyzed for gene ontology and STRING-PPI for potential protein-protein interactions with p53 or selected associated proteins. The proteins FANCB, RFC4, SKP2, AURKA, RRM2B, BUB1, STIL, DHX9, CASC5 are among a few that have the potential to interact with P53 or P53-associated proteins based on combination scores and the strength of observed and expected connections. This may further explain the mechanism of CBL0137 activity.

Video Games and Nutrition

Student Presenter: Kamille Williams, Evangelia Tsagaris, BinCheng Wang

Faculty Mentor: Melissa Huey

Department: Behavioral Sciences

School/College: College of Arts and Sciences, New York

Video gaming has become a major component of young American lives in recent years. Over the past several decades, there is a drastic increase in screen time and in turn, usage of video games (Johnson, 2018). As a result, this has impacted people's quality of life in terms of their emotional and physical health. More specifically, their eating habits have been impacted by the increased video game playing. The research surrounding this topic has contradictory evidence, with video games being correlated with not only binge eating (Arvaniti, 2011), but also snacking and fasting (Bellissimo, 2014).

The purpose of our research study is to examine the association between screen time and eating habits, in order to provide clarity on the contradictory research. We are going to investigate eating habits in terms of (a) binge eating; (b) snacking; and (c) fasting. We will recruit college students within the Behavioral Science Department at the New York Institute of Technology, as well as our university's gaming Discord servers (NYIT_Esports and New York Tech Deck) to take a brief survey about their video game and eating habits. We anticipate that excessive screen time from playing video games is positively correlated with binge eating unhealthy foods.

Esmeralda Santiago: Life and Work

Student Presenter: Karibay Angeles

Faculty Mentor: Jonathan Goldman

Department: English

School/College: College of Arts and Sciences, New York

My presentation is based on Esmeralda Santiago's life and career. The presentation's aim is to encourage other Latinx members by showcasing Esmeralda's passion for literature and contribution to her culture through her community work. I was able to find much of these materials on Esmeralda Santiago's personal webpage and through sources that included interviews. Also outlets that have devoted time to learning about her. According to my research, Esmeralda Santiago has published over 8+ novels, allowing us to peel back the layers of who she is. The majority of her books are about her culture and tell us about the migrant trip. Her success as a journalist has also inspired her to give back to her community and act as a spokeswoman for both the Latinx community and the world of literature.

Esmeralda is an inspiration to all people and her story of perseverance is what motivates us all to dream big. Esmeralda Santiago teaches us to pursue our dreams and to stand up for what we believe in.

Emotional Intelligence and Stress: Potential Impacts on Academic Performance and Medical Boards Licensing Scores

Student Presenter: Katherine Keever, Risa Kiernan

Faculty Mentor: Leslie Goldstein

Department: Clinical Specialties

School/College: College of Osteopathic Medicine, Long Island

Background: Emotional intelligence (EI) refers to one's ability to be aware of and manage emotions in themselves and others. High rates of stress and decreased levels of physical and emotional health have been found in medical students. Higher EI levels have been linked to increased happiness and improved ability to cope with stress. Previous attempts to incorporate EI training into medical education had positive results. We propose that higher EI in medical students is associated with decreased stress and thus improved boards licensing exam scores.

Methods: A systematic search was run on MEDLINE for articles published in the last 10 years.

Results: Students with higher EI were associated with an increase in happiness and psychological health. Those with higher stress levels were less happy with self-reported EI being a negative predictor for stress. The studies demonstrated that higher EI is associated with improved academic performance in medical school. Studies have documented positive correlations between medical teams' EI and the quality of their interactions. Clerkships that incorporated workplace EI training found medical students were more adaptable and proactive on their rotations.

Conclusion: EI plays a role in predicting emotional and psychological health along with academic performance in medical students. Our results indicate that EI training incorporation into medical education could be beneficial in improving academic performance, especially on licensing exams.

Can Photo Arrays With Crime Scene Backgrounds Impact Criminal Identification?

Student Presenter: Kevin Narine, Ryan Murphy, Angelica Mei, Brian Smith

Faculty Mentor: Andrew Costello

Department: Behavioral Sciences

School/College: College of Arts and Sciences, Long Island

Eyewitness identification is a mainstay of criminal prosecutions and is actively sought by prosecutors for presentation to jurors. In many jurisdictions, identification by a witness is a requirement to move forward on prosecutions of violent and intimate property crimes such as robbery or theft from a person.

Photo arrays are the most common form of eyewitness identification. Previous research at this institution has determined that photo arrays with the addition of contextual clues improves successful eyewitness identification over the standard 18% gray background used in arrest photographs in target present conditions. This previous research did not test for target absent conditions. Through a controlled experiment of a video of staged crime scene of the theft of a laptop from a professor in a lecture hall by a confederate posing as an IT technician, undergraduate students will be divided into a 2X2 factorial design of photo arrays with 18% gray backgrounds and the background of the crime scene placed behind the suspect and fillers in target present and target absent conditions. With this design, results may be obtained to prove the validity of the inclusion of context in photo arrays in improving successful eyewitness identification and also testing for correct rejection of photo arrays when the suspect is not present.

Astrocyte Connexin43 Localization is Altered by Potential Therapeutic Compound in a Mouse Model of Autism

Student Presenter: Kimberly Fasciglione, Mac Josh Reandelar, Violeta B. Roumenova, Aaron T. Miller

Faculty Mentor: Gonzalo Otazu Aldana, Randy Stout, Lars Udo-Bellner, Yan Li

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

Glial Fibrillary Acidic Protein (GFAP) is a cytoskeleton marker for astrocytes and increases upon central nervous system injury. Connexin 43 (Cx43), a gap junction protein expressed in astrocytes, regulates cognitive function, memory and epilepsy susceptibility. Cx43 forms gap junctions between astrocytes to facilitate potassium uptake and prevent neuronal hyperactivity. Cx43 aggregates (gap junction plaques at cell connections) are reduced in human autism spectrum disorder (ASD) brain tissue and in conditions of excitotoxicity and neuroinflammation (e.g. epilepsy).

ASD individuals have increased rates of seizures compared to neurotypical subjects. Children with mutant *Cntnap2* gene develop a condition called cortical dysplasia focal epilepsy starting at 15 months, and can present with intractable epileptic seizures and autism. To understand the role of Cx43 in this form of ASD, we quantified GFAP and Cx43 expression in the hippocampus of 9 *Cntnap2*^{-/-} mice. After administration of either compound X or saline, the hippocampus was imaged and layers CA1-CA3 were immunostained. Using intensity thresholding, we quantified the percentages of the image data that was occupied by intense Cx43 staining which represent clustered Cx43 and serve as a proxy for the amount of gap junctional coupling in astrocytes. We report preliminary results that a compound, which is currently being evaluated as a potential therapeutic, increases the expression of Cx43 with no effect on GFAP expression.

Towards early detection of Cervical cancer

Student Presenter: Krushang Kamleshkumar Pandya, Caroline Fernandez, Tanvi Patel, Brian Siuni, Sai Srija

Faculty Mentor: Niharika Nath

Department: Biology and Chemical Sciences

School/College: College of Arts and Sciences, New York

Cancer is the second leading fatal disease after heart diseases. Cervical cancer can be prevented by having regular screenings to find any pre-cancerous cytopathological abnormalities of the cells such as enlarged nucleus and to start early to treat them. The Pap smear test looks for any abnormal or precancerous morphological changes in the cells on the cervix. However, the manual screening of Pap smear in the microscope is subjective, time consuming and prone to human error. Our aim was to quantify morphology data based on their nuclear features and visualize the data for classification into two classes and further into multiclass categories of cell abnormality. The nucleus region of the images were extracted using a greedy active contour model in MATLAB, and various shape features including nuclear area, nuclear perimeter, solidity, and eccentricity were examined. The ground truth data for each shape feature was gathered and this served as a base to compare the visual analysis of the cell classes using Tableau. One of our main analysis is clustering and is based on the K-means algorithm which can group the data into one class based on its relativity to the mean of that cluster. Clusters and potential two and three classes were obtained which we then used to examine the accuracy of the classified cells. The results of the study explain that, at least in the two classes obtained, more than 85% of the plot from clustering was matched with the existing ground truth.

Characterization of Bone Morphology Preserved with Different Fixatives Using a MicroCT Scanner

Student Presenter: Lina Elkoulily, Cagri Senlik

Faculty Mentor: Claude Gagna

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Fixation of tissue is a critical part of histotechnology. No one has ever performed a comparative study of preserved bone tissue based on different fixatives. Preliminary studies were performed with cat femur bones, in order to learn how to use the microCT scanner (i.e., Bruker SkyScan 1173), and software (i.e., Dragonfly). This is the data we will be presenting at the SOURCE (i.e., Part 1).

Part 2 of our research project involves the bones of birds. Different fixatives were used in order to preserve adult (i.e., 9 weeks) male chicken (i.e., Cornish X) medullary bone tissue (i.e., femur; average length: 4.5 inches), so that we could determine the effects of fixation on overall bone morphology (e.g., bone cortex, epiphysial growth plate, proximal metaphysis, and diaphysis). We started the project with four fixatives, i.e., Davidsons, Carnoy's, Buffered Zinc Formalin, Davidson's and 70% ethanol. Tissues were then characterized using the Bruker SkyScan 1173 high-energy microCT scanner (NSF-NYIT grant: 1828305). We are examining both longitudinal and cross sectional views of the bone structure.

Based on the cat bones, our initial observations show that Davidson's fixative may have penetrated deeper into cortical bone and medullary cavity than 70% Ethanol. As the project continues to develop, we will examine the densitometric parameters of the chicken bone, as it relates to a specific fixative.

Peritoneal Dialysis Location of Training on Peritonitis Rate

Student Presenter: Mallika Chauhan

Faculty Mentor: Michael Hadjiargyrou

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Jonesboro

Mallika Chauhan and Tamorie Smith, MD

Objective:

The objective of this study is to investigate the relationship between peritonitis rates and whether peritoneal dialysis was taught in-center or in-home for 120 patients in a single center located in Southern Georgia.

Materials and Methods:

This study is a retrospective analysis for data that was accumulated over a period of seven years. Eligible subjects were categorized into two groups: one group's dialysis administrator received peritoneal dialysis training in their respective homes and the other group's dialysis administrator was trained in-center.

The initial statistical analysis was conducted using a chi-squared or Fischer's test for qualitative data and Welch's t-test for quantitative data. Further investigation was done for significant variables within baseline values by utilizing logistic regression methods.

Results:

There was no evident correlation between peritonitis rate and location of training ($P=0.352$).

Only one variable, the amount of peritonitis episodes, was identified as having a correlation to location of training ($P<0.050$). Yet, all regression models used returned insignificant r-squared values.

Summary:

Considering the use of limited data, the results can be deemed misrepresentative of the general peritoneal dialysis patient population. This study finds that location of training, in-home versus in-center, may not be an accurate gauge of peritonitis risk in certain populations.

Waste Management

Student Presenter: Manpreet Hanspal, Akshita Rathore

Faculty Mentor: Jeannette Sordi

Department: City and Regional Infrastructure and Resources

School/College: School of Architecture and Design, New York

An approach towards cost effective waste management and clean cities

Waste management is a concern for every city and needs an efficient approach by educating and encouraging people in contributing towards environmental stewardship. The strategy may have a scope for economical waste collection and segregation for a sustainable city design. We would like to draw your attention towards “residential waste”, considering that sustainability city approach should begin at doorstep. Residential waste is a matter of concern and needs an outline for management to be set in the community.

While researching this topic, we must familiarize with its cost and collection such as waste segregation, distance from collection sites to disposal sites, man-power etc.

As per NYC waste management statistics, Brooklyn has almost 68 community compost sites. Demographic of the garbage shows 59 existing and 5 proposed transfer stations. Recyclable waste holds 33% out of 100% residential waste. Last year, 4 trillion plastic bottles were sold worldwide. (source:<https://www.wordsinspace.net/mapsmedia/fall2017/2017/10/04/map-critique-new-dump-city/>;

<https://eportfolios.macaulay.cuny.edu/tomkiewiczsl1/asphalt-green/> ; map by J.Jambeck et al)

Garbage compost is in the groove with community gardens and public housing.

Another aspect of waste management is the recycling of the waste, thus there is a scope of remuneration of collection cost.

Be the solution to runoff the waste pollution.

LJD Bacterial Growth Experiment: O.D V.S CFU

Student Presenter: Manuel Ortiz

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Bacteria are microscopic organisms. They can grow quickly in cultures under laboratory conditions where they double every 20-30 minutes. Many experiments with bacteria require that one knows how many bacteria are in a culture prior to starting an experiment. However, enumerating bacteria is a time-consuming and tedious process involving many petri dishes and overnight incubation. We needed a fast, efficient way to enumerate a bacterial culture as it growing rather than after the fact. As bacteria grow, the culture turns cloudy, and bacteria scatter light (much like a fog). If a culture of bacteria is put into a spectrophotometer, the turbidity can be measured, which is quick and easy but is an indirect measure of population size. Although turbidity increases as with bacterial growth, dead cells and cellular debris also contribute to turbidity. We hypothesized that in a young, healthy culture most of the cells will be alive so the turbidity will more accurately reflect the bacterial population. We developed a method for rapidly determining bacterial cell population based on optical density using a calibration curve based on bacterial cell counts. This technique enables us to conduct experiments that demand that we know how many bacteria are in a growing culture at the time we are conducting an experiment. This validated technique is already being put to good use as a key component of experiments characterizing bacteriophages in Dr. Gibb's lab.

The Impact of Remote Learning on Mindfulness and Engagement

Student Presenter: Marissa Karasz, Zenab Shafiq

Faculty Mentor: Melissa Huey

Department: Behavioral Sciences

School/College: College of Arts and Sciences, New York

With the onset of COVID-19, many colleges and universities have made the quick transition to Zoom classrooms, as opposed to traditional in-person learning. The Zoom classroom, however, holds several unique challenges to overcome. Learning about a topic via Zoom can feel more disconnected, and staying fully engaged with the material can be challenging. (Besser, Flett, & Zeigler-Hill, 2020) Preliminary data has shown that integrating Zoom breaks & various backgrounds could prove helpful to alleviating these issues. For example, one study found that “from an educational point of view, it seems that active breaks could be considered as an effective instrument to improve classroom behavior, as well as impacting on attention and cognitive function.” (Masini et. al., 2020) The purpose of the proposed study is to compare the various modalities of Zoom backgrounds (no specific background, calm/relaxing virtual background, or other) and Zoom breaks (no breaks, one break, two or more breaks) and the effect that it has on the classroom learning in terms of (a) mindfulness; (b) academic achievement; (c) anxiety; and (d) engagement in the classroom. Surveys will be administered to students at NYIT once at the beginning of the Spring 2021 semester and once at the end of the semester. Results will be analyzed statistically. We hypothesize that calm backgrounds and one Zoom break will result in higher levels of mindfulness during class, lower levels of anxiety, and higher engagement.

The Impact of Mood and Stress on Memory and Problem Solving Ability

Student Presenter: Marissa Karasz, Ryan Arroyo, Devin Delvalle

Faculty Mentor: Melissa Huey

Department: Behavioral Sciences

School/College: College of Arts and Sciences, New York

Mood and stress play a large role in our everyday lives. They strongly impact memory, as well as our ability to problem solve. In one study, it was found that higher levels of stress throughout a person's lifetime led to overall higher levels of memory compensation. (Garret, Grady & Hasher, 2010) Another study found that people who are experiencing negative mood generally have lower levels of task capacity. (Pupillo, Phillips & Schnitzspahn, 2020) The research found here, if used effectively, could help people increase their productivity at work, in school, or in their everyday lives. The purpose of the proposed study is to measure people's baseline rates of mood and stress and the effect that this has in terms of (a) memory and (b) problem solving ability. Surveys will be administered to students at NYIT throughout the Spring 2021 semester. Participants will answer approximately 50 questions and results will be analyzed statistically through SPSS. We hypothesize that students who have the highest levels of stress will have the highest levels of memory and problem-solving ability. We also hypothesize that students with the lowest levels of mood will have the lowest levels of memory and problem-solving ability.

Can Artificial Intelligence Assist Surgeons in Identifying Landmarks In Laparoscopic Cholecystectomy Surgery?

Student Presenter: Matthew Brett

Faculty Mentor: Stephen DiRusso

Department: Clinical Specialties

School/College: College of Osteopathic Medicine, Long Island

Background & Objectives: Injury of the Common Bile Duct is a severe adverse outcome of Laparoscopic Cholecystectomy. A major reported risk factor for this injury is the misidentification of the anatomical structures (cystic duct, cystic artery, common bile duct) within the Critical View of Safety (CVS). A new artificial intelligence software, Cholecystectomy AI/Surgeon's JARVIS, evaluates the CVS and has potential to aid in the identification of critical structures. This study compares human versus JARVIS evaluation of the CVS and whether JARVIS score correlates with the relative experience of the evaluators.

Methods: 25 photos of purported CVS were analyzed using JARVIS. The photos were scored by the evaluators using a published 6-point scale (6PS) for analyzing the CVS. Medical students (3), residents (2), and an attending surgeon (1) were used as the evaluators for the photos. Spearman's statistical analysis was used to determine the correlation between the subjects' 6PS and JARVIS data.

Results: There was a statistical correlation between the evaluators' 6PS and JARVIS in scoring the CVS (ranges 0.39 to 0.49). The more experienced evaluators had a stronger and significant correlation ($p < 0.02$).

Conclusion: JARVIS has predictive validity in evaluating the Critical View of Safety during Laparoscopic Cholecystectomies. More data is needed to better establish this correlation.

Category & Audience Design

Student Presenter: Matthew Renz, Brandon Fanizza, Serena Sukhandan, Kyle Spiegel, Stuti Shah

Faculty Mentor: Nicole Calma-Roddin

Department: Behavioral Sciences

School/College: College of Arts and Sciences, Long Island

There are a lot of different “communities” that people may be a part of. A community can describe a group of people who have the same interests and know certain subjects well. Common ground is the knowledge that people share, such as knowledge that comes from being members of the same community. Fussell and Krauss (1992) examined how a speaker will shift how they communicate based on the common ground they share with their addressee. Category typicality is the concept that some things in a category are more typical than others (e.g., apples vs. pomegranates for fruit). Onishi et al. (2008) found that category typicality can also affect sentence structure, with more typical items mentioned before atypical ones. The purpose of this study is to examine how people use language to communicate based on what they know and the typicality of what they are referring to. Pairs of NYIT students will complete a matching game, in which one participant is the director and the other is the matcher. The director will see a pair of images that they must communicate to the matcher. The matcher will select which images the director is referring to. We predict that: (1) although speakers will tend to refer to the left image first, when the image on the right is more well-known than the image on the left, the director will refer to the image on the right first. And (2) if the director is a part of a community related to the image, the director will simply name the image rather than describe it.

Be the solution, stop pollution

Student Presenter: Meghan Jansen

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art & Design

School/College: College of Arts and Sciences, Long Island

My infographic displays a social cause for ocean pollution. My goal is to make people more aware of how much humans contribute to polluting the ocean and for them to be more cautious with their waste. The infographic shows data from all around the world and provides facts about ocean pollution but also what we can do as a community to help prevent plastic and other waste going into the ocean. Such has taking prevention as demanding plastic-free alternatives, avoiding ocean harming products and voting on ocean issues. In which this can help keep our oceans clean with making these changes to our everyday lives.

Examining Pleated Membrane Filter Performance Based on Pleat Packing Density and Cartridge Geometry

Student Presenter: Jay Patel

Faculty Mentor: Pejman Sanaei

Department: Department of Mathematics

School/College: College of Engineering & Computing Sciences, New York

Pleated membrane filters are widely used to remove undesired impurities from a fluid in many applications. A filter membrane is sandwiched between thick and porous support layers, then pleated and packed into an annular cylindrical cartridge with a central hollow duct for outflow. Although this arrangement offers a high ratio of surface filtration area to volume, the filter performance is not as efficient as those of equivalent flat filters. This stems from several possible hypotheses including the additional resistance due to the packing density of the pleats, the complex flow dynamics within the pleated membrane and possible damage of the membrane during the pleating process. In this work, we present an extension to a previous purely two dimensional model to investigate the effect of pressure variations along the axis of the filter cartridge in three dimensions. We also introduce a more sophisticated description of the cartridge geometry that accounts for the cylinder's curvature. Using asymptotic methods to simplify the flow throughout the cartridge makes it possible to investigate how the number of pleats or pleat packing density affects the performance of the pleated membrane filters, where the goal of this study is to find an optimal number of pleats to achieve a particular optimum filtration performance. Our findings establish the generality of the Goldilock's rule that neither too few nor too many pleats give optimum performance in a pleated filter cartridge.

Analysis of the Relationship between Geographical Location and Genetic Diversity of Phages that Infect the Genus *Arthrobacter* in the US

Student Presenter: Nayan Pallothu

Faculty Mentor: Leonidas Salichos, Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Osteopathic Medicine, Long Island

Bacteriophages or phages are viruses that infect bacteria to use for reproduction. In recent years, phages are becoming a promising weapon in our efforts to fight growing antibiotic resistance. Only a small fraction of the total number of estimated existing phages have been sequenced. In this study, we explore the evolutionary relationships between 270 phages that infect the bacteria species *Arthrobacter* in the US. Evolutionary cluster AZ includes phages Eraser, Phives, and Kaylissa that were found and annotated at NYIT within the scope of the SEA-PHAGES program. We ran a phylodynamic analysis to evaluate different evolutionary and growth models, identify evolutionary relationships between clusters and phages, estimate divergence times and geographic distribution. Our results show that Cluster AZ appears to form different subclusters, one of which contains Eraser and another Kaylissa. Interestingly, phage Eraser shows high genetic similarity and is grouped together with phages Elezi, Asa16, and Niobe, which were isolated in Connecticut and are estimated to share a very recent common ancestor from 2018. At the same time, Kaylissa clusters with Tbone, YesChef, and PowerPuff which were identified and isolated in California. Their common ancestor is estimated about 10 years ago. Due to their high host specificity, diversity, and abundance, the genetic and phylodynamic characterization of phages can provide valuable insights when studying their behavior and transmission.

Functional Outcomes in Patients Receiving Platelet-Rich Plasma (PRP) Injections Following Arthroscopic Repair for Meniscal and Rotator Cuff Tears: A Review

Student Presenter(s): Neil Gambhir, Forrest Butenksy, Hannah Fischer
Faculty Mentor: Olga Savinova
Department: Biomedical Sciences
School/College: School of Osteopathic Medicine, Long Island

Meniscus and rotator cuff tears are two of the most common orthopedic injuries, and although conservative treatment is favored, these tears typically necessitate the utilization of arthroscopic surgery. Recovery times from these surgical procedures are lengthy and complications such as re-tears often arise. The utilization of platelet-rich plasma (PRP) injections in conjunction with arthroscopic surgery is a new approach that physicians are exploring to improve post-surgical functional outcomes. In this review, we will explore literature over the past 5 years and summarize the conclusions regarding the efficacy of PRP injections measured as functional outcomes following meniscus and rotator cuff arthroscopic repair. Seven meniscus and rotator cuff clinical studies were included in our review, with significant differences found between control groups and PRP injection groups in the reported outcomes of one study. While the utilization of PRP injections is increasing, further investigation must be conducted to fully uncover their combined therapeutic potential alongside arthroscopic surgery.

Standardized method of photographing bacteriophage plaques

Student Presenter: Opong Bramble

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

The study of microbes of microbes often involves growing them on petri dishes. Although some microbes are easy to see with good contrast (photogenic), others are not. Complicating matters, inconsistent lighting can create glare or uneven exposures when photographed.

We developed a standardized method for photographing microbes in petri dishes to ensure consistent high quality images for documentation and publication. We tested different lighting solutions to reduce glare, improve contrast and even exposure across the plate for imaging bacteriophage plaques. Bacteriophages are viruses that infect bacteria, in an agar petri dish as they kill the bacterial host, clearings, called plaques are formed. Some phages that completely kill bacteria that they infect create clear plaques, while others do not always kill all the bacteria, so the plaques are hazy and can be difficult to see, let alone image. Through testing various scenarios the method we developed incorporates a light box and vastly improves the ability to image low contrast phage plaques, and does so consistently that can be adjusted to fit the environment in which they will be photographed.

Predicting the masses of subatomic particles using string theory

Student Presenter: Patrick Mazza, Trinh La

Faculty Mentor: Sophia Domokos

Department: Physics

School/College: College of Arts and Sciences, New York

The traits of subatomic particles like protons and neutrons are very difficult to describe from first principles, because their constituent parts interact so frequently and forcefully that we cannot keep track of them. This research focuses on providing insight into an alternative method for understanding the behavior of subatomic particles: holographic duality, a concept derived from string theory. Holographic duality is based on the idea that our world is a lower dimensional "hologram" of a higher dimensional universe, in which the behavior of subatomic particles is easier to understand. We use holographic duality to make predictions for the masses of particles called mesons, which we then compare to experimental data.

Smoking Infographic

Student Presenter: Philip Cohen

Faculty Mentor: Patty k. Wongpakdee

Department: Digital Art and Design

School/College: School of Architecture and Design, New York

My Project is a infographic on the dangers of smoking and what the consequences are if people continue to smoke. It shows off facts and some illustrations I created as well as the information I found. Links are on the bottom right corner of the infographic and I hope this poster becomes a reminder for those who wish to never smoke and also protect them from the harm smoking can do to one's body.

Physiological Stability of LKSleep, Shaolin, and RW Phages

Student Presenter: Rahul Ubriani, Salman Khan

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Bacteriophages are a type of virus that infects bacteria by injecting its genetic material into the host and utilizes host machinery to reproduce. These mechanisms of infection and their development inside of its host consists of complex processes that enable these phages to be researched heavily. For the purposes of this research, we are interested in subjugating phages LKSleep, Shaolin, and RW to different temperatures, pH, and salt concentration environments. Each of these phages were isolated in differing conditions, with LKSleep and Shaolin from kitchen sponges and RW from sewage water, hence covering a wide range of host environments. We would like to investigate how stable these sets of phages are in a variety of conditions and what effects these changes have on infectivity. This will be performed through modification of the phage buffer by changing its chemical environment, via either addition of a reagent or change in incubation technique. This enables each phage buffer to be unique and provides us with variable sets of data to compare and contrast to our control group: a normal phage buffer. Data will be collected by way of plaque assays to observe levels of infectivity in different conditions. Our data at the end of our experiment leads us to conclude that modifying phage conditions greatly affect the transduction of phages into bacterial hosts.

Temperature and pH stability of LKSleep, Shaolin, and RW

Student Presenter: Rahul Ubriani, Salman Khan

Faculty Mentor: Bryan Gibb

Department: Biological and Chemical Sciences

School/College: College of Arts and Sciences, Long Island

Bacteriophages at its core structure are simple protein coats surrounding a region of DNA or RNA. However, their mechanisms of infection and their development inside of its host consists of complex processes that enable these phages to be researched heavily. For the purposes of this research, we are interested in subjugating phages LKSleep, Shaolin, and RW to different temperatures, pH, and salt concentration environments. We would like to investigate how stable these sets of phages are in a variety of environments and what effect it has on infectivity. We will begin this experiment by first growing a set of bacterial hosts for the phages to inject itself into. After growing our hosts, we will modify the phage buffer, which is selected for each particular phage, by changing the environment of the buffer. This is done by increasing/decreasing the temperature and pH or even adding particular salt concentrations. This enables each phage buffer to be unique and provides us with variable sets of data to compare and contrast to our control group which will contain a normal phage buffer. Once we have assembled our modified phage buffers we can add the phage and begin the infection to test the effect of the conditions of our phages by way of plaque assays. Our data at the end of our experiment leads us to conclude that modifying phages greatly affect the transduction of phages into bacterial hosts.

Determination of Cardiac Risk Factors in Trauma Patients May Yield Insight Into Improved Care

Student Presenter: Richard LaRocco, Scott Livitz, Stephanie De Mel, Taner Celebi, Dana Schulz

Faculty Mentor: Stephen DiRusso

Department: Clinical Sciences

School/College: College of Osteopathic Medicine, Long Island

Introduction: Co-morbidities significantly contribute to worsening population health in the US with heart disease being the number one cause of death. This study will attempt to examine the influences of cardiac-related co-morbidities on trauma outcomes.

Methods: St. Barnabas Hospital Trauma Registry data (2016 – 2019) was used. There were 2009 patients with co-morbidities included in this study. Patients under the age of 40 were excluded (low/no prevalence of Co-Morbidities). Risk factors included: hypertension, hyperlipidemia, cardiac pathologies, current smoking status, and diabetes. Logistic regression analysis was used to assess the impact of co-morbidities while controlling for other factors such as age, race, ethnicity, gender, obesity, NISS and insurance. Dependent variables were: Mortality, Intubation, ICU Admission, Rehab vs Home and Length of Stay. Accuracy of predicting each outcome was determined using the Area Under the Receiver Curve (AuROC) and Odds Ratios were calculated. Cardiac risk factors with ($p \leq 0.05$) were determined to be significant contributors to the outcome.

Results: AuROCs for each model ranged from: 0.69 (LOS) to 0.85 (mortality). Models for each dependent variable demonstrated that patients with cardiac pathologies and current smokers were the major contributing factors in affecting patient outcomes.

Conclusions: Co-morbidities clearly affect trauma patient outcomes and need to be an important consideration in their care.

How to Efficiently Simulate Granular Materials: From Cell Membranes to Sand

Student Presenter: Samantha Rivera

Faculty Mentor: Eduardo Corona

Department: Mathematics

School/College: College of Engineering and Computing Sciences, Long Island

Granular materials and “wet” colloidal suspensions constitute the second most handled media in the global industry. They are constantly found in geophysical matter, raw industrial materials, and biological environments such as sand, coal, and bacterial colonies. While these materials can be easily modeled in terms of particle interactions, we lack a well-developed theoretical framework for them due to the complex, non-linear behaviors emerging from these interactions. Simulations modeling granular media rely on various principles from solid mechanics, fluid dynamics, and statistical physics. Accurate simulations of granular media are needed for proper design and analysis of the physics and engineering of materials. However, their relevance is not limited to scientific application; in fact, these simulations are essential in computer graphics and video games.

In order to produce high fidelity simulations of granular media and wet suspensions, efficient numerical methods must be applied to address the many challenges involved. In this talk, I will be presenting our research involving the investigation and implementation of novel adaptive time stepping techniques to an optimization-based model of granular systems. Our main objective in this ongoing work is to optimize state-of-the-art simulation methods in order to implement an informative and optimal computational framework of granular materials.

Get your own Hobby! Why consumers' hobbies elicit territorial behaviors during the COVID-19 pandemic

Student Presenter: Saniya Ratnani

Faculty Mentor: Coleen Kirk

Department: Management

School/College: School of Management, New York City

The COVID-19 pandemic related mandates have disrupted consumer behavior. A surge in consumer interest in do-it-yourself activities and hobbies during the COVID-19 pandemic has been well documented (Kirk and Rifkin 2020). Consumers waited too long to find yeast for bread making and tools for home hair dyeing, and they were also intimidated by dalgona coffee. Nonetheless, consumer motivations for picking up new hobbies during the pandemic are less recognized. The purpose of this study is to examine how consumers adopted new hobbies during the COVID-19 pandemic. Do they feel “ownership” of the hobby they acquired? How did consumers switch to their new hobby or habits during the global crisis? However, psychological ownership can also elicit territorial responses, in which individuals react defensively when they feel that their psychological ownership of a good is threatened by others' signals of ownership (Kirk, 2017; Kirk, Peck, & Swain, 2018). We propose that two of the Big Five personality domains (Gosling, Rentfrow, and Swann Jr 2003), and dual-process control (Rothbaum, Weisz, and Snyder 1982) theories, we propose that consumers are exploring new hobbies during the Pandemic in order to occupy themselves during the time saved and to satisfy the need for taking control. Preliminary findings will be presented at the conference.

Internally Validated Artificial Neural Network for Benchmarking Performance in an Urban Trauma Center

Student Presenter: Scott Kivitz, Dana Schulz, Stephanie De Mel, Sonia Amanat, Taner Celebi

Faculty Mentor: Stephen DiRusso

Department: Clinical Specialties

School/College: College of Osteopathic Medicine, Long Island

Introduction: Current practice is to use externally validated survival prediction models to assess mortality. In this study, we use a locally generated prediction model that is internally validated to assess that Trauma Service's performance over time.

Methods: Retrospective study design used an urban Level-II ACS Trauma Center trauma registry (2016 to 2019). Mortality prediction was modeled using Multilayer Perception Artificial Neural Network (ANN). Independent Variable Importance was calculated. Discrimination (Area under the Receiver Operator Curve (AuROC)) and calibration (Hosmer-Lemeshow C-statistic (HL-C)) measured predictive capability.

Results: Model included 3,468 patients, 2,581 (74.4%) in 2016-2018 (training set), and 887 (25.6%) in 2019 (test set), with AuROC of 0.947 and an HL-C of 12.75 ($p > 0.05$). Predicted and observed mortality (95% CI) from 2016-2018 was 3.56% (3.11, 4.01) and 4.0% (3.21, 4.78), respectively. With 2016-2018 as a reference, 2019 predicted mortality (3.65%, 95% CI: 2.91, 4.41) did not differ from observed mortality (3.0%, 95% CI: 1.82, 4.18). Although not statistically significant, the trauma service improved its mortality rate by 25% (2016-2018 compared to 2019).

Conclusions: We generated and internally validated an ANN model with excellent prediction of survival and used this to assess Trauma Service performance for the subsequent year. We will use this model on a continual basis to benchmark Trauma Service performance.

Common comorbidities in COVID-19 patients associated with ICU admission and mortality at Saint Catherine of Siena Medical Center

Student Presenter: Sebastian Geraci, Justin Newman

Faculty Mentor: Olga Saninova

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

This cross-sectional study examined comorbidities in patients with COVID-19 at Saint Catherine of Siena Medical Center between 3/8/20 to 4/29/20. Patients' age, gender, ethnicity, BMI, and number of comorbidities were assessed in relation to level of care and mortality.

The Effects of 3D Printed Cell-laden Strontium-doped Alginate-Collagen scaffolds on Osteoblast Behavior

Student Presenter: Shebin Tharakan

Faculty Mentor: Azhar Ilyas

Department: Electrical and Computer Engineering

School/College: College of Arts and Sciences, Long Island

Bone fractures in the elderly are expected to increase 87% by 2025. While bone autografts and allografts are used for critical size defect treatment, alternative approaches are critical due to donor site infection, limited supply, and patient compliance. Three-dimensional (3D) bioprinting is capable of creating biological or synthetic constructs that provide a novel route for applications in bone-implant systems. These 3D printed scaffolds can contain growth factors and stem cells to enhance bone regeneration. Adipose-derived stem cells (ADSCs) can differentiate into the osteoblast lineage and are easily harvested from adipose tissue making them desirable over bone-marrow stem cells which require an intensive harvesting process. Alginate and collagen composites have shown promising results for fracture healing; making them potential candidates for cell-laden scaffolds. Furthermore, studies have shown strontium, a calcium analog, to enhance osteogenesis while inhibiting bone resorption by osteoclasts. Our study aims to determine osteoblast behavior when coupling strontium with human ADSCs in alginate-collagen composite scaffolds. The viability of the stem cells before differentiation is measured through an MTT assay at 1, 4, and 7 days post-printing to confirm no adverse effects from the biomaterials or the printing process. Following this, differentiated cells are analyzed by Raman Spectroscopy at 7, 14, and 21 days post-printing to study the presence of biomineralization.

Teens and Social Media

Student Presenter: Stacie Kiriazis

Faculty Mentor: Patty K. Wongpakdee

Department: Digital Art & Design

School/College: College of Arts and Sciences, Long Island

The increase in technology in the past decade has been astronomical. Social Media has progressed at such a rapid pace that many scientists are truly unaware of the effect this would have on our society, especially the youth. Teenagers seem to be one of the largest demographics drawn to social media. Over 95% of teens own a cellphone and that percentage will only increase in the next coming years. By having a phone, social media platforms are always just a press away which can bring many advantages. This includes being able to connect easier with family and friends and the access to important information easier than ever before. While there are all these positive effects caused by social media, there are also a lot of negatives we need to consider. This all comes down to whether or not the positives outweigh the negatives and if this rapid increase of social media presence will cause more harm than good in the future. I created a data visualization poster to help depict the positive and negative effects of social media on teens while also bringing up other important statistics and numbers that can impact the opinions people may have about this topic.

Istanbul - Site Investigation

Student Presenter: Stuart Jacome, Ariel Lorenzi, Antony Rosas, Eddy Voltaire, Elsie Torres

Faculty Mentor: Giovanni Santamaria

Department: Architecture & Design

School/College: School of Architecture & Design, Long Island

The following video is the result of a team effort within the first semester of final Thesis Studio in the B.Arch program at the School of Architecture and Design of New York Tech.

The goal of this investigation is to establish a framework that will permeate into our individual design proposals for Istanbul's Halic shipyard and urban plan. The initial analysis focuses on prevalent topics across dimensional scales, global to regional- trade, government, environment, energy, and demographics. This "layered biography" framed within the historic pcontext, and more specifically the post-industrial site of Halic Shipyards along the Bosphorus River allows the team to better understand the city of Istanbul (Turkey).

These studies further inform the framework of six thematic and design-oriented approaches that synthesize the DNA of the current Turkey: Mismanagement of environmental policy, the in-between nation, geopolitical unrest, reconstruction of national identity, Islamization to generate soft power, and towards an autocratic economy and spirit. A better understanding of the ongoing systems, and their interaction has enabled us to clarify the country's dynamics, introduce design proposals that could empower sustainable growth; balancing and improving ecological, urban, and social vulnerabilities.

Youtube Video Link: <https://www.youtube.com/watch?v=w13rx5VL30c&t=140s>

HEALTH POLICY RESEARCH: The Marijuana Opportunity Reinvestment and Expungement Act (MORE Act; H.R. 3884)

Student Presenter: Tija Passley

Faculty Mentor: Jeorg Leheste

Department: Biomedical Sciences

School/College: Health Professions, Jonesboro

The MORE Act was passed by the House of Representatives on December 4, 2020 aimed to de-schedule and decriminalize use, possession, distribution, sale, and production of medical marijuana on the federal level. Additionally, other provisions include the creation of an Opportunity Trust Fund that is funded by the revenue of the Cannabis tax to cover the cost of a community reinvestment grant program for communities disproportionately affected by the War on Drugs, as well as a cannabis opportunity program for marijuana entrepreneurs and an equitable licensing program for the development of comprehensive equity programs. If the bill becomes law, it will impact a variety of public and private stakeholders, such as federal, state and local governments, law enforcement, marijuana entrepreneurs, healthcare providers, and the general public. This Health Policy Brief provides a comprehensive view of stakeholder perspectives and positions, potential benefits and pitfalls and ends with a recommendation by the authors regarding its implementation.

Youth Involvement and Participation in the 2020 Myanmar Elections

Student Presenter: Tint Tha Ra Wun

Faculty Mentor: Jeaniffere Vila

Department: English

School/College: College of Arts and Sciences, New York

Youth are considered to be less experienced when it comes to politics and elections. Studies have shown that the youth voter turnout is relatively low when compared to other age group populations. Myanmar (officially the Republic of the Union of Myanmar) is a country in Southeast Asia. Under the 2008 Constitution of Myanmar, the government system being practiced in Myanmar is neither parliamentary democracy nor presidential democracy, but it is somewhat between the two [Myanmar (Burma)]. According to the Constitution, a general election is to be held every five years in order to elect parliamentarians to the two legislative chambers, the House of Representatives and the House of Nationalities (Htut 255-272). This study aims to investigate the participation of young voters aged 18-24 in the 2020 Myanmar elections. An online questionnaire was conducted, and the responses from 100 eligible participants were used as the primary data of this research paper. It had been predicted that less than 50% of the survey respondents answered that they participated in the 2020 Myanmar elections. The results obtained were unexpected: a strong 94% of the survey participants cast their votes in the 2020 Myanmar elections. Thus, it is concluded that youth, specifically youth in Myanmar, may not be as indifferent in politics and elections as generally considered.

GAD67 Expression in the Piriform Cortex of Cntnap2 Mice

Student Presenter: William Shin, Yamini Nori, Himani Jani, Aaron Miller, Mac Josh Reandelar

Faculty Mentor: Randy F. Stout

Department: Biomedical Sciences

School/College: College of Osteopathic Medicine, Long Island

Olfactory deficit is characteristic of Autism Spectrum Disorder (ASD) and can lead to malnutrition. The Contactin-Associated Protein-like 2 (Cntnap2) gene is associated with ASD. Recent work (Li et al 2020) has shown that olfactory discrimination of odors in Cntnap2 mice was similar to that of Wild-type (WT) mice, but was severely impaired in the presence of novel background odors. Cntnap2^{-/-} mice express decreased glutamate decarboxylase thereby decreasing the number of GABAergic interneurons in the neocortex. This reduction suggests a possible mechanism for the observed odor discrimination deficit in the presence of novel odors. Herein, we evaluated the number of inhibitory interneurons in Cntnap2^{-/-} mice within the piriform cortex, a brain region associated with olfaction, by staining for GAD67, a marker for GABAergic neurons. Using the software Fiji-Image J, we analyzed images of brain samples and counted the number of neurons in layer 1 of the piriform cortex expressing GAD67 and compared the cell number between Cntnap2^{-/-} mice and WT mice. Preliminary results show that there was not a statistically significant difference between the two groups. The next steps will be testing for any morphological differences in piriform cortex inhibitory neurons and comparing the number of inhibitory neurons in other brain regions of WT and Cntnap2^{-/-} mice. By localizing the cause of olfactory deficit, more targeted treatments can be developed to alleviate olfactory symptoms in ASD.

Effect of Eccentricity in Microwave Imaging of Multiple Composite Pipes

Student Presenter: Yuki Gao, Noshin Raisa

Faculty Mentor: Reza K. Amineh

Department: Electrical and Computer Engineering

School/College: College of Engineering & Computing Sciences, New York

The use of non-metallic composites that are durable, low cost, and lightweight is growing fast in various industries like the oil and gas industry. A commonly used form of these materials is in the shape of pipes. Such pipes can be damaged due to material loss (defects and holes), erosions, and more which may cause major production failures or environmental mishaps. To prevent these issues, non-destructive testing (NDT) methods need to be employed for regular inspections of such components. Since traditional NDT methods are mainly used for metallic pipes, microwave imaging has recently been proposed as a promising approach for examination of non-metallic pipes. While microwave imaging can be employed for inspection of multiple layers of pipes, the effect of eccentricity of the pipes (undesired distance between the centers of multiple pipes which are supposed to be concentric) can impose additional imaging errors. For the first time, we study the effect of eccentricity of the pipes on the images reconstructed using near-field holographic microwave imaging when imaging double pipes through simulations. To have a realistic study, we add artificial noise to the simulated data.