CSI UNDERGRADUATE CONFERENCE

RESEARCH, SCHOLARSHIP, AND PERFORMANCE

CELEBRATING 20 YEARS ANNIVERSARY

Thursday, April 29, 2021

College of Staten Island
The City University of New York

www.csi.cuny.edu/ugconference

CC CLUE

VIRTUAL EVENT

CSI Virtual Undergraduate Conference

Message from the President

Welcome! This year, we are celebrating CSI's 20th Undergraduate Conference on Research, Scholarship, and Performance, an event that is always a highlight of the Spring semester. I am delighted that we have been able to continue an important tradition despite the many challenges and obstacles we have faced over the course of this past year. Through persistence, commitment, and a love of learning as well as teaching, all of you have made this conference possible.

For this year's virtual event, we have approximately 100 student presentations covering a wide range of disciplinary and interdisciplinary fields. In addition, we will be showcasing the creative works and performances of our talented students with links to the Student Art Gallery and Music Program.

World-class faculty mentor our students here at CSI. We know, and research shows, that these opportunities influence career choices and establish the foundations for future studies and professional training, often changing life trajectories. It is CSI's faculty whose dedication to our students bring about these wide-ranging experiential learning opportunities.

Let us take a moment to be proud, not only of the students and faculty represented in today's conference, but of everyone who has worked so hard throughout this year. As the saying goes, "It takes a village" and so let me also acknowledge the contributions of the many people who have helped put together this year's conference program and abstracts, as well as posters, and provided the technical expertise for this virtual meeting.

Congratulations to all participants and enjoy the presentations and posters.

Sincerely,

WJ Fritz

William J. Fritz
President

START TIME	TRACK 1	TRACK 2	TRACK 3	TRACK 4	TRACK 5
	Psychology	Psychology | English/Linguistics World Lang. & Literatures | English History | Curriculum & Instruction Educational Studies Sociology/Anthropology | Media Culture	Physics & Astronomy | Mathematics Engineering & Environmental Science	Nursing | Biology | Chemistry	Computer Science | Marketing Management | Accounting & Finance
SESSION ONE					
12:30 PM	WELCOME Provost Michael Parrish ************* KEYNOTE SPEAKER Professor Ellen-ge Denton	WELCOME Provost Michael Parrish ************* KEYNOTE SPEAKER Professor Ellen-ge Denton	WELCOME Provost Michael Parrish ************* KEYNOTE SPEAKER Professor Ellen-ge Denton	WELCOME Provost Michael Parrish ************* KEYNOTE SPEAKER Professor Ellen-ge Denton	WELCOME Provost Michael Parrish ************* KEYNOTE SPEAKER Professor Ellen-ge Denton
12:45 PM	PSY-01 *Is Infant Sleep Related to Early Motor Milestone Onset?* Kalindi Mishra	PSY-21 *Different Types of Bilingualism and Working Memory Capacity* Victoria F. Nicoletta	PHY/AST-01 *Cellular Automata, Quantum Circuits, and Chaos* Justin M. Peterkin	NRS-01 *The Role of Nurses in the COVID-19 Vaccination Effort* Sara Filip	CSC-01 *Optimized Tunnel Image Enhancement* Konstantin Novichenko
12:55 PM	PSY-02 *How is Infant Sleep Disrupted Around Crawling Onset?* Marina N. Morkos, Michelle W. Saad	PSY-22 *Attention Shifting from Social and Non-Social Images as a Predictor of Autistic Traits in Infancy* Keren Isufi	PHY/AST-02 *Comparison of E+A Galaxies in the Coma Cluster* Sam Pakravan	NRS-02 *International Virtual Exchange Program: Fostering Global Health by Forming Intercultural Partnerships* Ariana Moy, Mary Fowokan, Tara Gerbino, Alexarae Pomaro, Sara Filip, Camille Ponce	CSC-02 *COVID-19 Virtual Test* Victoria Fischer
1:05 PM	PSY-03 *Parent and Infant Sleep Changes During COVID-19* Daniel Palmieri, Martina Youssef	PSY-23 *Characterization of Dopamine Neuron Glutamate Release Sites in Striatal Gray and White Matter Regions* Clare L. Mitchell	MTH-01 *Math Performance in Relation to SES* Richard T. Sciarrino	NRS-03 *Sudden Infant Death Syndrome: Can We Reduce The Risks of Infantile Tragedy?* Alexarae Pomaro	CSC-03 *Meducation* Jasper Caballero, Jan Markus Milan
1:15 PM	PSY-04 *The Significance of Sleep In Infants* Ricaute E. Rogers	PSY-24 *How Does Religion, Income, and Duration of a Relationship Effect Romantic Relationships* Nicholas P. Morreale	EES-01 *Ground Truthing in Staten Island Urban Forests using GPS and GIS Technology to Collect Data for a Plan to Improve the Trails Network* Matthew Wilhelmsen	NRS-04 *Prevention of Falls in Patient Care Settings* Salma E. Taha	CSC-04 *Haunted Decoder* Alan Eappen
1:25 PM	PSY-05 *How Does Co-sleeping Affect Infant Sleep?* Rehab Sobhi	ENG/LING-01 *The Syntax and Semantics of WH-marked Yes/No Questions* Karen Correa		NRS-05 *Analyzing the Stigma Associated with Mental Illness* Arianna F. DiBenedetto	CSC-05 *Symmetric Searchable Encryption Scheme – Implementation of a Secure Index* Jacob Chen
1:35 PM	PSY-06 *Educating College Students about Digital Footprints and Internet Algorithms* Ariana A. Hernandez	ENG/LING-02 *The Role of Autistic Traits on Acoustic Measures of Vowel Intelligibility in Male and Female Speakers* Alexandra V. Diaz, Maha S. Elcharfa, Krissy Dellecave		BIO-01 *Neurodegeneration and Diabetes, Link and Therapeutic Approaches Statistical Analysis* Mario Laniado	CSC-06 *Social Network for International Students* Chukwurado Umeaka
10 Min	BREAK	BREAK	BREAK	BREAK	BREAK
SESSION TWO					
1:55 PM	PSY-07 *The Effects of Mortality Salience on Support for President Donald Trump and Presidential Candidate Joe Biden* Denis Eder, Kailey Volpetti, Hanna Youstina, Karen Youssef, Caroline Saad, Samantha McGrath, Jessica Grande	WL&L-01 *Deaf People Accessibility Healthcare* Jacquelyn M. Mahoney	EES-07 *Parallel Parking System* Nicholas W. Pilacinski	BIO-02 *Destabilized Structural Region of Tau Sequence Possibly Contributes to Alzheimer's Disease* Aumir Sajjad	MKT-01 *Chatbot for Eldercare* Cindy Rong
2:05 PM	PSY-08 *How Does Awareness of Cognitive Difficulties and Worthlessness Feelings Relate to Depression Severity Among Youth?* Victoria Mollo	ENG-01 *How the Drowned Become Water* Anes Ahmed	EES-11 *Improving User Interface for PC Gaming* Eslam H. Hegazy, Dario Simontacchi, Safraz Juman	BIO-04 *COVID-19 and Heart Disease Nationwide Trends* Nana Dufie Akowuah	MKT-02 *Digital Marketing During COVID-19: Consumer Shifts in the "New Normal"* Corina Gerbino
2:15 PM	PSY-09 *The Anxiety and Fears of Going to the Dentist* Silvy Mansor	ENG-02 *Not So Nonsensical: Exploring Lewis Carroll's Representation of Victorian Childhood in Alice's Adventures in Wonderland* Danielle R. Cabanas	EES-15 *Lift Assist* Daniel Zaloga-Lakatosz, Perbibaj Marjan, Stanly M. Sachin	BIO-05 *Age, Gender, and Race as Factors Associated with Oropharyngeal Cancer* Aseel Alsahori	MKT-03 *The Battle Between Poland's "LGBT ideology-free" Zones and the European Union as a "LGBTIQ Freedom Zone"* Skyler Labetti
2:25 PM	PSY-10 *Beliefs about the Causes of Autism in Kenya: Comparing Community Conceptions to Personal Beliefs* Lily Chen, Catherine Messina	HST-01 *Nationalization and German Folklore: The Politicized Education of German Women in the Third Reich* Kaitlyn Casserly	EES-02 *Security Sensory Assistive Monitor* Martin J. Alava, Nathaniel Furhang, William Cole	BIO-06 *The Correlation between Twitter and Breast Cancer GoFundMe Campaigns* Gianna Elci	MGT-01 *Impact of the Covid-19 Pandemic on the Jersey Shore BlueClaws* Joshua Pinedo

Conference Schedule

	TRACK 1	TRACK 2	TRACK 3	TRACK 4	TRACK 5
2:35 PM	PSY-11 *Using a Participatory Autism and Universal Design Training for Faculty to Improve the Educational Success of Diverse Students* Kyle Gravitch, Deondre Williams, Alesya Guastella	C&I-01 *History and Pedagogy: Hidden Connections* Aleena Abraham	EES-03 *Intelligent Cat Feeder Project* Valjeta Demirovic, Tony Chan	BIO-07 *Predicting Cancer Incidence and Mortality Rates with Twitter* Yilam Ng Cen	MGT-03 *Leadership Styles Effect on Employees' Work Ethic* Stephanie Donkor
2:45 PM	PSY-12 *Comparing Narrative Writing of Autistic and Nonautistic College Students* Sergey Shevchuk-Hill, Shana Szczupakiewicz	EDU-01 *Adolescent Cognitive Brain Development* Susan M. Albarano	EES-04 *Outdoor Weather Station* Alkhansa Nusrallah, Abir Abou Znak	BIO-08 *IL-6 Signaling Pathways Gene Expression in Metastatic Breast Cancer (MBC)* Lara A. Colombo	MGT-04 *Management in the Age of Millennials and Gen Z* Andrew N. Farmer
2:55 PM	PSY-13 *Examining the Motivations and Career Goals of Autistic High School Students within an Informal Technology Program* Shana R. Szczupakiewicz, Theresa Antony, Rheniela Faye Concepcion	EDU-02 *How Can Teachers Offering Choice in their Classrooms with a UDL Framework, Raise Academic Integrity and Honesty in Students?* Angelina D'Aquino		BIO-09 *The Role of Rukobia in Infectious Disease* Alyssa Costantino	
10 Min	BREAK	BREAK	BREAK	BREAK	BREAK
			SESSION THREE		
3:15 PM	PSY-14 *A Study of Virtual Reality Used as a Treatment for Specific Phobias and Agoraphobia* Michael Reynolds	SOC/ANT-01 *South African Migration Drivers* Gregory T. Fazio	EES-05 *HUD Helmet* Michael A. Seleznyov, Mark Khalfin	BIO-10 *The Effects of Biktarvy on Reducing HIV Viral Load and Increasing CD4+ Cell Count* Clarice L. Ifraimova	ACCT/FNC-01 *Identifying the Inclusions and Exclusions to and from Gross Income for Purposes of Federal Taxation* Buddini S. Ilangachcharige
3:25 PM	PSY-15 *The Myriad of Factors that Affect a Woman's Sexual Self-Schema* Gabriella Cosenza	SOC/ANT-02 *Migrant Access to Healthcare and Education in South Africa* Angelica Lisiewski	EES-06 *Controlled Robotic Arm Synchronized With 3-D Prototype Glove* Patryk Zagula, Daniel Ferraro	BIO-11 *The Role of Artesunate in Cancer Treatment* Anas Owda	ACCT/FNC-02 *The Evolution of Intelligent Automation and Its Impact on Accounting Firms in an International Environment* Nicole C. Agu
3:35 PM	PSY-16 *Breaking Down Bias: An Empirical Study On Transgender Prejudice* Kylie M. Dalessandro	SOC/ANT-03 *Understanding Atheism and Its Stereotypes in the United States* Justin Garlisi	EES-09 *Fluffier Rice with Optimized Heating Cycle* Anthony Deng, Alberto Coats Jr., Kevin Jeong	CHM-01 *Applications of Photodynamic Therapy in Wound and Burn Healing: a Literature Review* Anastasia Maximenko	ACCT/FNC-03 *An Analysis of the Impact of the COVID-19 Pandemic on New York City's Budget* Angelyne Acevedo
3:45 PM	PSY-17 *John William Money: Deviant or Misunderstood Researcher* Annet C. Sokol	MC-01 *Environmental Justice and Media Narrative: Fresh Kills Park's Rise from the Ashes* Vincent Villani	EES-10 *Depression Detector: Detecting Depression Using Vocal Features* Safia H. Djemil, Mohamed Elkoptan, Joel Tlapanco	CHM-02 *Applications of Singlet Oxygen in Photodynamic Therapy: Aiding in the Sterilization Process for Root Canal* Mehnoor Khan	ACCT/FNC-04 *Effects of the Tax Cut and Jobs Act on New Yorkers* Dilmi I. Fernando
3:55 PM	PSY-18 *Circadian Rhythms of African Naked Mole-Rats* Ashraqat Mahmoud	MC-02 *The Cultural, Political and Social Impact of Video Gaming* Adam Blyth	EES-13 *Maximum Power Point Tracking of Photovoltaic Arrays* Khurram Qasir, Hamza Shehadeh, Flopatir Heness	CHM-03 *The Comparative Susceptibility of Oral Biofilms to Photodynamic Therapy* Danielle Ohana	ACCT/FNC-05 *Blockchain's Effect on Accounting* Watuthanthirige R. Alwis
4:05 PM	PSY-19 *The Naked Mole-Rat: A New Model for Psychiatric Research* Kelly Brennan	MC-03 *Representation of the Deaf Community in a Digital Age: Social Media as a Cultural Tool* Veronica P. Pistek	EES-16 *Intelligent Fog Machine Controller* Aleksandr Zubreev, Victoria Paskevich		ACCT/FNC-06 *The Earned Income Tax Credit: The Working Americans Lift Against Poverty* Fjolla Kida
4:15 PM	PSY-20 *3-Dimensional Reconstruction of Cleared Tissue in the African Naked Mole-Rat* Amaney Hassan	MC-04 *The Influence of Covid-19 on Social Media and Society* Ilia Krisulas			

THE DEPARTMENT OF

PERFORMING AND CREATIVE ARTS

PRESENTS

AN ART AND MUSIC EXPOSITION

at the

20th Annual
CSI Undergraduate Conference
on Research, Scholarship,
and Performance

PERFORMANCES FEATURING STUDENTS FROM THE MUSIC PROGRAM OF THE COLLEGE OF STATEN ISLAND

SENIOR PROJECT PERFORMANCE

Mauro Corona, Percussion student of Prof. David Clive, two pieces from his Senior Recital:

A Minute of News (1990) ……Eugene Novotney (b. 1960)

Rhythmania (1941) ……Charles Wilcoxon (1894 - 1978)

Mauro Corona, snare drum

Matthew Parenti, Percussion student of Prof. David Clive, Johnathan Hernandez, and David Peralta, Guitar students of Prof. Victor Magnani, from their combined Senior Recital:

Strasbourg St. Denis …… Roy Hargrove (1969-2018)

Johnathan Hernandez, guitar

David Peralta, guitar

Matthew Parenti, drum set

Brandon Auerbach, electric bass

STUDENTS OF THE CSI YOUNG ARTISTS PROGRAM

Graduating seniors, Gwendolyne Brown, student of Prof. Elena Heimur, Jiefeng Zhao, student of Dr. Sylvia Kahan, and Rey Ramirez, student of Prof. Edward Brown will perform:

“Du bist die Ruh" …….. Franz Schubert (1797-1828)

Gwendolyne Brown, Soprano

Ah Ram Lee, piano

Sonata in G minor, Op. 49 No.1, Mvt. 1 Andante …….…… Ludvig van Beethoven (1770-1827)

Prelude in E minor, Op. 26 No. 4,……..…Frederic Chopin (1810-1849)

Jiefeng Zhao, piano

Étude no. 13 "The Rose in the Garden" ……Carlo Domeniconi (b. 1947)

Rey Ramirez, guitar

THE CSI JAZZ ENSEMBLE, directed by Prof. Michael Morreale, will present two recordings from this semester's work, recorded at Moon Studios by Prof. Henry Falco:

Alter Ego …….. James Williams (1951-2004)
Yardbird Suite ……Charlie Parker (1920-1955), arranged Lyle "Rusty" Dedrick (1918-2009)

Justin Hernandez, trumpet
Anthony De Rosa, tenor saxophone
Adam Alvarez, tenor saxophone
David Peralta, guitar
Michael Morreale, piano
Matthew Parenti, drum set (Alter Ego)
Christopher Armenta, drum set (Yardbird Suite)
Guest Artist/Clinician: Vincent Guarna, contra bass

CSI MUSIC TECHNOLOGY DEPARTMENT

Fall 2020 Mixing and Mastering Class, Prof. Henry Falco

Sir Duke ……. Stevie Wonder (b. 1950)

Music performed, recorded, mixed, and mastered by the students in the class:

Johnathan Hernandez – voice
Anna Mengani
Omer Mirzo
Matthew Parenti
David Peralta
Rey Ramirez
Jiefeng Zhao
With guest horn section:
Justin Hernandez – trumpet
Michael Morreale – trumpet
Anthony De Rosa – alto saxophone

https://www.youtube.com/watch?v=HSVOkE8hGOE

UNDERGRADUATE RESEARCH CONFERENCE EXHIBITION

Faculty advisor: Professor Beth Livensperger, Assistant Professor of Painting

The URC Exhibition is a curated group exhibition representing a wide range of production from the CSI Art program. This year's exhibition includes work in drawing, painting, sculpture, printmaking, and photography.

Curated by CSI Art and Photography Full-Time Faculty

Miguel A. Aragón (Printmaking)

EXHIBITORS:

Alondra Acevedo
Daniel Almazo
Ia Boutros
Mary Brick
Angelica Cheriel
Sarah Correa
Theresa Cusmano
Kevin del Rio
Elizabeth Diliberto
Rehma Fatima
Greg Fazio
Lorianna Fernandez
Brianna Flores
Gianna Gentile
Brianna Hernandez
Kasun Jayasekerage
Alison Katz
Sylvia Krauss-Grimm
Alanna Kroening
Ka Fai Lam
Grace Miranda-Villalobos
José Pinto
Vanessa Robinson
Maria Rosas
Margaret Rowan
Amanda Russo
Katlyn Stanzione
Samantha Wilkinson
Nissa Velez
Ting Ting Xiao
Cianta Zapata

Work produced under the tutelage of Professors:

Miguel Aragón (Printmaking)
Haley Bueschlen (Photography)
Dillon Dewaters (Photography)
Jade Doskow (Photography)
Nicole Frocheur (Photography)
Dianne Hebbert (Drawing)
Kate Pollard Hoffman (Photography)
Beth Livensperger (Drawing and Painting)
David Loncle (Drawing and Painting)
Craig Manister (Painting)
Marsha Pels (Drawing)
Ben Peterson (Sculpture)
Beatrix Reinhardt (Photography)
Naomi Safran-Hon (Drawing and Painting)
Howard Smith (Drawing and Painting)
Marianne Weil (Sculpture)

https://pcacsishared.wixsite.com/studentgallery

POSTER PRESENTATIONS

ACCOUNTING AND FINANCE

POSTER: ACC/FNC-01

Identifying the Inclusions and Exclusions to and from Gross Income for Purposes of Federal Taxation

Buddini S. Ilangachcharige
Faculty Mentor: Professor Deborah Brickman
Department of Accounting and Finance

The purpose of this study is to identify and explain the inclusions and exclusions to and from gross income as reported on Form 1040, the Individual Federal Income Tax Return. Gross income is the starting point in calculating taxable income which is the amount subject to tax. Gross income is defined by Section 61(a) of the Internal Revenue Code as all income from whatever source derived, reduced by certain specific items. This research project is designed to explain the principles used to determine who is taxed on a particular item of income, when the item is taxable, whether or not an item is considered as income, and what conditions must be met to include the item(s) in gross income. It will also discuss compliance and procedural considerations for inclusions and exclusions of gross income.

POSTER: ACC/FNC-02

The Evolution of Intelligent Automation and Its Impact on Accounting Firms in an International Environment

Nicole C. Agu
Faculty Mentor: Professor Patricia Galletta
Department of Accounting and Finance

Intelligent automation is the digital future of many industries, including accounting firms, investment banks, and international businesses. Intelligent automation revolves around digital transformation and it is being expanded enormously to allow better accuracy of data analysis, time efficiency, and productive outcome of business goals. International trades and the operation of national corporations are not business as usual in the modern age and intelligent automation is responsible for this. Advanced technology has improved the way individuals, government and corporations interact with each other. Major industries, including the Big 4 accounting firms and investment banks, also embrace the logistics behind intelligent automation because it makes productivity efficient and timesaving. The Big 4 accounting firms, which are Deloitte, Ernst & Young, PwC, and KPMG, conduct their businesses on both an international and national scale. Professionals in respective service areas are responsible for handling the challenges of both the national and global operations. These companies utilize artificial intelligence to perform their jobs effectively, minimize human errors on internal workpapers and when analyzing client's data. Not only does intelligent automation affect businesses, but it also plays a huge role in international trade wars. For instance, the most critical international trade war is between China and the U.S. These two countries have powerful economies and advanced technology to increase production efficiency.

This research project will cover the four pillars that make up intelligent automation: business process management; artificial intelligence; robotic process automation; and integration. This research will also focus on several components of international business such as finances, contract regulations, foreign business laws, and treaties and the factors influencing international business. Furthermore, this research will explain the various challenges accounting firms face in the international environment and will highlight the impact of intelligent automation on accounting firms.

POSTER: ACC/FNC-03

An Analysis of the Impact of the COVID-19 Pandemic on New York City's Budget

Angelyne Acevedo
Faculty Mentor: Professor Joseph Petrucelli
Department of Accounting and Finance

This project is an analysis of New York City's ability to financially respond to COVID-19. Despite legislation passed by the federal government, we will examine COVID-19's negative budgetary impact on the City's ability to fund local projects, support taxpayers and businesses. On March 1st, 2020, the first case of the Coronavirus was confirmed in New York City and since then New York City has been struggling with containing the deadly virus and the impact that it has had on the city's financials. With the closing down of businesses and the new normal of virtual meetings, New York City should adapt to the drastic effects of the pandemic. We have examined the budgetary impacts of COVID-19 and will show the financial areas that have been most affected. As of March 9, 2021, Coronavirus has killed 47,966 New Yorkers. New York state received over $112 billion dollars from the federal government as a result of the CARES Act and still, the people and businesses in New York City suffer. The federal aid that the federal government had implemented had a small impact on relief for New York City inhabitants during the Coronavirus pandemic. With the CARES Act, hundreds of thousands of dollars were sent to New York, however, New York is continuing to make cuts within the state, like police and hospitals, to make up for lost money. New York City has not been transparent with the funding received from the federal government.

POSTER: ACC/FNC-04

Effects of the Tax Cut and Jobs Act on New Yorkers

Dilmi I. Fernando
Faculty Mentor: Professor Joseph Petrucelli
Department of Accounting and Finance

Do you ever wonder how much hidden taxes you pay? Every individual who earns income throughout the year has to pay the relevant taxes by the end of April 15th of the following year. Out of the 50 States in the USA, New Yorkers pay significantly more taxes than other states, since they have to pay income taxes at federal, state, and local levels. In addition to these taxes, there are additional taxes and fees. A New Yorker who earns around $60,000 to $150,000 income per year has to pay 22% to 24% as their income taxes.

The Tax Cut and Job Act introduced by President Trump's Administration in 2017, was intended to provide relief by cutting several taxes individuals pay. The results of this Act were not the results people expected because not all taxpayers, especially New Yorkers, did not benefit from it. My research findings, within a reasonable degree of professional certainty, will demonstrate how the Tax Cut and Job Act in 2017 did not provide relief to US citizens, especially to New Yorkers.

Many CUNY College of Staten Island faculty and students live in New York, and it is important to give them an idea about what taxes and fees they pay and how the tax law affects their daily lives. Two main pieces of literature reviewed for this research are the US Census and the New York State Department of Taxation and Finance website. With the evidence gathered, the final conclusion for this research was that the Tax Cut and Jobs Act in 2017 did not provide any tax relief to New Yorkers, since they still have to pay more in taxes both upfront and hidden like in the past.

POSTER: ACC/FNC-05

Blockchain's Effect on Accounting

Watuthanthirige R. Alwis
Faculty Mentor: Professor Joseph Petrucelli
Department of Accounting and Finance

This research project will show the positive impact blockchain technology will have on the accounting profession. "Blockchain" can be defined as a system and way of recording information that is nearly impossible to change, hack, or alter for nefarious purposes. Blockchain is a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems, ultimately leading to a high level of transparency among all parties involved. The researcher will examine various companies' transactions, utilizing block chaining technology and demonstrate the need to take into consideration the complex regulatory, tax, auditability, risk, and compliance implications. The decentralized, distributed ledger that records the origin of the digital asset. This study is relevant since many organizations are eager to embrace technology that leads to better communication and transparency. Block chaining technology addresses the 21st century online currency and transaction reporting. It will also demonstrate that blockchain technology does not replace the accountants needed to monitor these transactions but rather, creates a new out-of-the box method to safeguard the assets and integrity of the transactions.

POSTER: ACC/FNC-06

The Earned Income Tax Credit: The Working Americans Lift Against Poverty

Fjolla Kida
Faculty Mentor: Professor Benjamin Silliman
Department of Accounting and Finance

As a student enrolled in ACC 597 (Accounting Internship), I have had the opportunity to join the IRS's Volunteer Income Tax Assistance (VITA) program where low-to-moderate income workers and families file free tax returns with the assistance of volunteers. Because the amount of tax refunds varies by case, a factor making a significant difference is the refundable tax credit known as the Earned Income Tax Credit (EITC). For this study, I used published research studies and government reports to gain a deeper understanding of EITC. Enacted by President Gerald Ford in 1975, EITC has gained bipartisan support because of its ability to increase and reward work, reduce reliance on welfare, and its ability to lift millions of Americans out of poverty. As one of the largest antipoverty programs, according to the Center on Budget and Policy Priorities, in 2018 EITC has lifted 5.6 million people out of poverty, three million of them children. Despites its economic benefits, new research suggests the increase of income from EITC makes a significant impact on the emotional and physical well-being of recipients of all ages. In this study I will examine EITC's major expansions and its positive effects particularly on single mothers and their children. From decreasing infant mortality, to better school performance, the economic and non-monetary benefits are endless. Of course, as a credit with positive outcomes, it does not stand without flaws, but maximizing its efficiency by creating a simple and free-for-all filing method with periodic payments can result to even greater outcomes.

BIOLOGY

POSTER: BIO-01

Neurodegeneration and Diabetes, Link and Therapeutic Approaches Statistical Analysis

Mario Laniado
Faculty Mentor: Professor Alejandra Alonso
Department of Biology

Tau is a microtubule-associated protein that stabilizes neuronal microtubules under normal physiological conditions. Tau is a phosphoprotein, and the degree of phosphorylation is important for the normal functions of tau. We use a transgenic mouse model that expresses pathological human tau (PH-Tau). In our lab, we currently work on two projects: the effect of Direct Current Stimulation on clearance of PH-Tau in vitro and in vivo, and on understanding the link between Alzheimer's Disease (AD) and Diabetes.

Transcranial Direct Current stimulation (tcDCs) has been shown to improve cognitive functions in healthy people, however, the effect of Direct Current (DC) stimulation on improving memory in individuals suffering with mild forms of dementia is controversial. Previously, it was shown that tcDCS results in upregulation of HSP70 (heat shock protein 70), the molecular chaperones responsible for targeting and degradation of misfolded proteins. Patients with diabetes have an elevated risk of developing AD. Similarly, AD patients have a higher-than-normal tendency to develop type 2 diabetes or impaired fasting glucose. In our lab we are trying to study and understand the link between blood glucose levels in our PH-Tau expressing mice and compare them to control mice. The aim of this project is to learn how to perform statistical analysis on data obtained from different experimental procedures and draw valid conclusions based on this analysis. Based on these analyses we found that tcDCS leads to an increase of HSP-70 and a decrease in PH-Tau. The statistical analysis of fasting glucose levels in our transgenic mouse model compared to those in the control group will be presented. The statistically significant and insignificant data findings will be provided and discussed in this study.

POSTER: BIO-02

Destabilized Structural Region of Tau Sequence Possibly Contributes to Alzheimer's Disease

Aumir Sajjad
Faculty Mentor: Professor Alejandra Alonso
Department of Biology

Tau is a highly soluble microtubule associated protein that regulates the stability of microtubules in neurons. Microtubules are important components of the cytoskeleton, formed by polymerization of dimers of alpha and beta tubulin. Under normal conditions, Tau phosphorylation aids in cytoskeleton stability. Phosphorylation is a post-translational modification of proteins that adds a phosphate group to the side chain of an amino acid. Phosphorylation at specific amino acid residues in Tau can regulate its affinity for microtubules. In Alzheimer's disease, tau is hyperphosphorylated and it has been proposed that hyperphosphorylation induces a gain of toxic function. This disease is progressive and leads to the destruction of memory, mental impairment and ultimately death. Hyperphosphorylated Tau become aggregated and form neurofibrillary tangles. Tau also changes the subcellular localization, from the cytoskeleton to the somatodendritic compartment and the nucleus. In our lab, we found that tau phosphorylation at positions 199, 212, 231 and 262 are enough to convert tau into a toxic molecule, and it also translocates into the nucleus. We have used pseudophosphorylation, i.e., to change the amino acid from Ser or Thr in the tau sequence with Glu, to mimic phosphorylation and we have generated a pathological human tau (PH-Tau). Using a computer program to predict the secondary structure of tau, we found that PH-Tau exposes the nuclear localization signal more than the full-length normal protein. We investigated the tau sequence between residues 202-395 because this region of interest appears to indicate the overall stability of the tau-microtubule complex. Our research revealed that, despite the total number of amino acids in both Tau's remaining the same, PH-Tau was larger in size than normal Tau. However, the region of interest, 202-395, of PH-Tau was smaller in size than the same region in normal Tau, and may preclude the Tau-microtubule complex sufficient for stabilization, causing tangle formation. Recalling that pseudo phosphorylation mimics hyper phosphorylation, the latter, thus, likely hinders Tau interaction with microtubules and consequently causes destabilization and tangle formation. Therefore, hyper phosphorylation induces toxic function in Tau.

POSTER: BIO-03

Role of Insulin Receptor in the Brain

Reem Gouda
Faculty Mentor: Professor Abdeslem El Idrissi
Department of Biology

We have shown that taurine supplementation increased islets size in the pancreas and insulin production by β cells. These changes in pancreatic function are responsible for the increased resistance to glucose challenges in taurine-fed mice. Control mice showed a significant increase in plasma glucose concentration 30 min after glucose injection with a gradual decrease thereafter. By 120 min, mice were slightly hypoglycemic relative to baseline. In contrast, taurine-fed mice showed a drastically different response to glucose injection. There was a delayed peak of plasma glucose at 60 min post injection and the plasma glucose in these mice was significantly lower than controls at all times measured ($p < 0.001$). These data were reproduced in avian. Insulin is primarily a metabolic hormone functioning on muscle, fat and liver via activation of IR receptor. Insulin also function on other non-metabolic tissues such as the brain. Once insulin is secreted it crosses the blood-brain barrier by a transporter-mediated saturable mechanism. The IR is widely expressed in the brain at various levels. This regional specificity implicates insulin, through activation of its receptor, in various brain functions that are mediated by these brain structures. In this study, we propose to examine the levels of insulin receptors (IR) expression in the pancreas and brain in controls and taurine-fed pigeons. In mice, we found a significant increase in IR expression in all brain regions and pancreas compared to controls. Here, we propose to investigate the expression pattern of IR and how it is affected by taurine in the avian model. Interestingly, changes in the expression levels of insulin receptors were associated with changes in the expression levels of glucose transporter (Glut 4) in neurons. We suggest that circulating levels of insulin regulate the expression levels of insulin receptors in the brain that in turn regulate neuronal bioenergetics through regulation of the expression of Glut4.

POSTER: BIO-04

COVID-19 and Heart Disease Nationwide Trends

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Department of Biology

A new severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), also known as COVID-19 was first detected in December 2019, in the city of Wuhan, China after a cluster of reported pneumonia cases. However, in March 2020, the World Health Organization declared the novel coronavirus a pandemic. At the time of writing, COVID-19 has claimed almost 3 million lives worldwide. The United States has recorded over 550,000 deaths and over 30 million total cases, making the US the worst hit nation in the world. COVID-19 is a respiratory illness, and its impact on the heart is enormous and cannot be overlooked. Since the heart needs to work harder when there is a respiratory illness, people with pre-existing heart disease are at higher risk of dying from COVID-19. This study aims to compare COVID-19 death rates across the nation with cardiovascular disease death rates to determine if there are trends observed in COVID data for states known to have a history of high versus low cardiovascular disease rates. Data will be collected from the CDC website. The study will explore nationwide statistics in COVID-19 and cardiovascular diseases to look for trends amongst states, gender, and ethnicity.

POSTER: BIO-05

Age, Gender, and Race as Factors Associated with Oropharyngeal Cancer

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For the past 10 years, the incidence of Oropharyngeal cancer (OPC) has been surging in the United States. Over 225,649 new cases of OPC in the US were reported by the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI). Oropharyngeal Cancer develops from squamous cancer cells (SCC) that arise from flat cells located on the tongue, tonsils, and oropharynx. Oropharynx cancer is often asymptomatic, and can be fatal if the cancer is not treated in its early stages. Human papillomavirus (HPV) is a prevalent sexually transmitted disease known to infect the mouth and throat as well. If HPV remains in the infected person for a long period of time, it can evolve into Oropharyngeal cancer. Other OPC risk factors include alcohol consumption and smoking tobacco. This independent study aims to determine whether age, gender, and race play a role in the incidences from each of the leading causes of Oropharyngeal cancer, including, HPV, tobacco use, and alcohol consumption. The data used to conduct this research will be obtained from the CDC and the Official Federal Cancer Statistics (USCS). Insight into the factors surrounding OPC may provide valuable information towards better prevention and treatment methods.

POSTER: BIO-06

The Correlation between Twitter and Breast Cancer GoFundMe Campaigns

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Department of Biology

GoFundMe is a crowdfunding platform that enables people to raise money for a cause. Twitter, the social media platform that allows individuals to “tweet” messages is often used to promote GoFundMe campaigns. I hypothesized that tweets are an effective mechanism to promote awareness of breast cancer by directing donations to cancer-related GoFundMe pages. To address this hypothesis I generated a computer-operated system that automatically collects and analyzes real-time tweets that mentioned both breast cancer and GoFundMe in the tweet text. This system runs autonomously 24 hours a day, 7 days a week during the first 2 weeks of every month and has been operating since the beginning of October 2019 – to date more than 500,000 tweets have been analyzed in this study. To determine the effectiveness of tweets at raising breast cancer donations I created a computer system that automatically determined at the end of each month the dollar amount raised, the total goal, and the percent goal for each breast cancer GoFundMe breast campaign mentioned by a tweet. This analysis allowed for a month to month comparison that focused on differences between each month in terms of breast cancer-related tweets and their ability to raise money on the GoFundMe platform for breast cancer causes. Initial results have found that in the six months analyzed so far, October, which is the breast cancer awareness month, contained the most breast cancer-related tweets/retweets and raised the highest amount of money through GoFundMe pages. October also contained the highest percentage of tweets promoting GoFundMe pages that were made for charitable institutions such as the American Cancer Society. These findings indicate that cancer awareness campaigns such as that seen in October for breast cancer are highly effective at raising money in part by encouraging people to use Twitter to promote GoFundMe breast cancer-related pages. The study aims at collecting twitter data and related GoFundMe data for one year so that each month can be compared to all other months.

POSTER: BIO-07

Predicting Cancer Incidence and Mortality Rates with Twitter

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I hypothesized that the social media platform Twitter is a good predictor of the monthly cancer incidence and mortality numbers issued by the National Cancer Institute. My project counted the number of tweets that contained words related to incidence or mortality and mentioned one of the seven (7) most common cancers. Therefore, for each month, Twitter "incidence" and "mortality" data were collected for lung, breast, prostate, melanoma, colon, bladder, and leukemia cancers and compared to monthly 2019 NIH incidence and mortality rates. To perform this analysis I generated an autonomous computer system that collected real-time cancer-related tweets each month. Using data analysis I then compared Twitter "incidence" and "mortality" data to NIH data to see if they show similar trends or unique differences. This analysis has been running for the last 7 months and will be complete after one year has been collected. My analysis has revealed that in general Twitter data can predict monthly cancer incidence and mortality rates, however, several months contained twitter data for specific cancers that were significantly different than the NIH data. These differences, in part, may provide insight into the effectiveness of cancer awareness campaigns or could uncover unique events that have occurred in that month as it relates to specific cancer. This study will reflect on both of these scenarios and continues to show how Twitter is a powerful predictor of cancer statistics and events.

POSTER: BIO-08

IL-6 Signaling Pathways Gene Expression in Metastatic Breast Cancer (MBC)

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Department of Biology

Despite all the progress made, Cancer remains a challenging disease. Aggressive cancer, Metastatic Breast Cancer (MBC) is particularly difficult in terms of treatment. This form of breast cancer takes the lives of 40,000 people annually. Women are far more likely to develop metastatic breast cancer compared to the male gender due to the increased amount of breast cells found in women. However, it is important to note that men are still capable of being a target. Since the immune system plays an essential role in cancer development, interleukin-6 (IL-6) is an essential molecule that controls multiple aspects of human immunity in the immune system. Cytokines, which are signaling molecules with immune responses, are growing in interest in how they shape cancer cell growth and spread cancer from one part of the body to another, also referred to as metastasis. The primary focus of this research project is exploring patterns of gene expression of IL-6, a key pro-inflammatory (which promotes inflammation causing the disease to become more severe) cytokine, in Metastatic Breast Cancer. Findings of statistically significant over or under expressed genes of the IL-6 pathway can help shed more light on the interaction between immunity and cancer in addition to having potential for identifying novel drug targets and treatment. In this study, the average invasive tumor tissue medians were compared to the normal tissue control for the genes IL-6, IL-6R Alpha, and STAT 3. Additional components of the IL-6 signaling pathway are being researched in this study. The preliminary data collected indicates that the IL-6 signaling expression in invasive tumor tissue deviates from the normal tissue control.

POSTER: BIO-09

The Role of Rukobia in Infectious Disease

Alyssa Costantino
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Department of Biology

About 37 million people are diagnosed with HIV worldwide. Antiretroviral drugs can be implemented to treat and delay effects, however HIV is highly susceptible to mutation, resulting in difficulties with treatment. In HIV patients with multi-drug resistance an antiretroviral drug with a novel mechanism may be necessary. Rukobia (Fostemsavir), can be beneficial in these types of patients. According to the BRIGHTE study (n=371 {99 non randomized participants}), patients who received rukobia had a notably greater decrease in HIV-1 RNA levels, than those who received the placebo. This research project will examine the role of rukobia in the body in respect to the role of glycoproteins in biological processes, the mechanistic details of the types of immune cells that are protected by rukobia from HIV viral attachment, and how rukobia can be combined with existing anti-HIV drugs to increase treatment efficacy.

POSTER: BIO-10

The Effects of Biktarvy on Reducing HIV Viral Load and Increasing CD4+ Cell Count

Clarice L. Ifraimova
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Department of Biology

At present, there is still no cure for HIV. Drug combinations have, however, shown success in keeping HIV under control by decreasing viral load while increasing CD4 count. This research project focuses on describing and discussing major drugs used for HIV combination treatment in terms of the mechanism of action for each drug and what drives the combined successful therapeutic effect in reducing viral load and increasing CD4 count. Specifically, research will focus on the following three drugs: Bictegravir, Emtricitabine, and Tenofovir alafenamide, a combination called Biktarvy by Gilead. Multiple studies and clinical trials will be analyzed, and data will be presented in a table format. A general discussion on the role of CD4+ immune cells and the combined successful therapeutic effect in reducing viral load and increasing CD4 count shall also be included.

POSTER: BIO-11

The Role of Artesunate in Cancer Treatment

Anas Owda
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Department of Biology

Artesunate is a semi-synthetic derivative of artemisinin that is also water soluble. It is derived from a Chinese medicinal herb. Scientists have started using it to fight against cancer. This is very important and can potentially be a major breakthrough in the battle against cancer. The way it fights cancer is using the way cancer spreads against itself. Cancer needs iron to spread from cell to cell. Iron and artemisinin enter the cell together which creates special atoms, called free radicals. The free radicals are able to kill the cancer cells without causing any harm to the healthy calls. This method has also shown to cause cancer cells to stop dividing, self-destruct, or even cut them from their blood supply. Although there has not been an approved cancer treatment protocol with artemisinin or artesunate, it will theoretically be proven useful. This treatment is sometimes used when the cancer cells are resistant to chemotherapy and the drugs administered during that treatment. This form of treatment is also non-toxic, easy to administer, and much cheaper than most of the cancer treatments available. Looking at articles and studies to find how effective this treatment option is, I found that patients with Artesunate treatment have shown at least a 12% reduction in cancer calls. The research of Artesunate on cancer treatment is fairly new and requires much further research and testing.

POSTER: BIO-12

Disease Outbreak Effect on Hospitals Overall Operation

Jacqueline D. Torralba
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Department of Biology

Currently, the United States is in a state of vulnerability with the COVID-19 pandemic. One would think with technology and medicine so far advanced, that the Nation would have reacted to this pandemic more efficiently. Hospitals and other healthcare facilities play an important role in response to emergencies– communicable disease pandemics included. Many health centers have protocols in place for infection prevention and control, which are enforced by the Worldwide Health Organization (WHO) and Centers for Disease Control and Prevention (CDC). Adequate measures and detailed plans are put in place to prevent and control those diseases such as COVID-19. Important factors to consider are personal protective equipment (PPE), proper isolation, maintenance of human life equipment, like ventilators, and a way of developing and producing new vaccines. Two areas that are important to battle the COVID-19 pandemic are dealing with sick patients and combating the spread by vaccinating populations. In addition, adequate workflow is needed in hospitals; there must be airborne and contact precautions, room cleaning, protocols for sick or exposed employees, enough PPE and equipment. Future training is required to ensure adequate prevention, prompt response, control, and a guide for hospital workflow.

CHEMISTRY

POSTER: CHM-01

Applications of Photodynamic Therapy in Wound and Burn Healing: a Literature Review

Anastasia Maximenko
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Department of Chemistry

Burns are a global public health issue because wound infections are a common complication that delay, or prevent, healing. Reductions in overall wound-infection rates will be beneficial to patient outcomes and reduce overall costs. Inevitably, all wounds will be colonized by some bacteria. However, Staphylococcus aureus bacteria accounts for the majority of wound infections. Outbreaks of various multidrug-resistant (MDR) bacterial strains happen at an alarming rate, and physicians and patients are in need of alternative treatment options. It has been suggested that the use of topical antibiotics induce antibiotic resistance faster compared to oral antibiotics. This review assesses an alternative treatment, photodynamic therapy (PDT), for the treatment of burn and wound infections. PDT uses light, a photo-sensitizer, and molecular oxygen to form an excited state of oxygen, known as singlet oxygen to cause cell death and kill microbial cells. PDT offers multiple advantages over antibiotics and UV therapy. In particular, PDT shows broad antibacterial activity, offers rapid action, localized treatment, lower risk of systemic side effects, and leads to effective inactivation of bacteria regardless of drug resistance. However, there are some challenges pertaining to the use of PDT, such as imperfect selectivity for bacteria over proteins and cells. Currently, it has not been demonstrated if bacteria can develop resistance to PDT. In this literature review, I will discuss the applications of PDT in burns and wounds, assess the level of bacterial inactivation, summarize recent clinical trials, and consider possible uses of PDT to treat other dermatological conditions.

POSTER: CHM-02

Applications of Singlet Oxygen in Photodynamic Therapy: Aiding in the Sterilization Process for Root Canal

Mehnoor Khan
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Department of Chemistry

Every year there are approximately 15 million root canals performed in America. A root canal is a repairment performed on the tooth to save it. Many problems arise from a chemical and a mechanical perspective when root canal is performed. Occasionally, the mechanical issues include missing one of the canals, infection if the bacteria are not completely removed from the canal, or the tooth's seal wasn't correctly placed. The current method to disinfect/sterilize a root canal procedure uses aqueous sodium hypochlorite, known as bleach. Sodium hypochlorite is affordable but has severe complications when it comes into contact with soft tissue. Furthermore, it is toxic, discolors, corrodes, and is ineffective in removing the layer of debris formed from the drilling on the canal walls. Without the removal of the smear layer, sodium hypochlorite is ineffective in removing all the bacteria. A technique that would be safer and more consistent in eradicating bacteria in the canal is needed. Currently, Photodynamic Therapy is the most promising alternative.

Photodynamic Therapy utilizes visible light, a photosensitizer, and molecular oxygen to produce an excited state of oxygen called singlet oxygen and other reactive species. Singlet oxygen can kill bacteria both when the photosensitizer has diffused inside the bacteria and when it is located outside of the bacteria. When the photosensitizer absorbs light, it transfers energy to oxygen, forming singlet oxygen. Singlet oxygen can then attack the cell membrane and diffuse inside the organism and reacts with the internal bacterial compounds. In this poster I will describe the Photodynamic Therapy techniques in detail and summarize results from in-vivo trials by studying the different effective reagents and methods utilized.

POSTER: CHM-03

The Comparative Susceptibility of Oral Biofilms to Photodynamic Therapy

Danielle Ohana
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Department of Chemistry

The prevalence of periodontal diseases, such as periodontitis, ranges from 31-76%, and their advanced forms affect approximately 11% of the global population. Through recent treatment and analysis of periodontal pathologies, it has become evident there is a great need for an innovative treatment with greater capabilities than traditional scaling and root planning alone or the use of antimicrobial agents. Photodynamic therapy (PDT) has the potential to fulfill this need. PDT is a non-invasive therapeutic modality that can be used to treat various periodontal pathologies. PDT is reliant on the combination of ground-state molecular oxygen (3O2), a photosensitizer (PS), and light to form reactive oxygen species with cytotoxic action. Specifically, by a Type II photo-process, energy transfer from the PS triplet state to ground state molecular oxygen (3O2) occurs, which creates excited state singlet oxygen (1O2). Singlet oxygen oxidizes many biological molecules and ultimately leads to complete inactivation of target cells. However, the lack of methodological standardization among studies still hinders the establishment of ideal parameters for PDT. In this literature review, the efficacy of photodynamic therapy with various PSs on different biofilms of known periodontal pathogens was assessed. Studies performed with different wavelengths, PS composition and concentration, irradiances of light, output power, application strategies, and bacterial species were standardized analytically and directly compared to evaluate the conditions under which PDT yields optimal results.

COMPUTER SCIENCE

POSTER: CSC-01

Optimized Tunnel Image Enhancement

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Department of Computer Science

In recent years, imaging systems for autonomous vehicles have attracted more attention in the transportation industry. Most autonomous vehicles are already equipped with sensory devices such as cameras, radar, and lasers to allow the car to perceive the world around it. This is natural since autonomous vehicles must first see better than humans to drive safer than humans. However, these images are captured under poor illumination conditions that often exhibit low brightness, low contrast, narrow gray range, and color distortion, seriously affecting the subjective visual effect and significantly limiting autonomous vehicles' performance vision systems. Additionally, the tunnel environment is unbalanced and has considerably lower illumination, including tunnel lighting and light reflected from driving vehicles, and the captured images are hazy, blurry, and noisy. This project aims to improve the interpretability or perception of information in tunnel images for both human viewers and the automated image processing systems. In this research, we created a system for optimized contrast enhancement of tunnel images. The proposed method uses (i) an S-curve contrast stretching algorithm that increases the dynamic range of the gray levels in the image, (ii) Contrast Limited Adaptive Histogram Equalization (CLAHE) algorithm to improve the contrast tunnel image, and (iii) an optimized gamma correction algorithm. The resulting image shows improvements in contrast compared to the original image and the traditional state-of-the-art contrast stretching algorithms. The developed method can be used for – car crash detection, bike riders, pedestrian detection application, and structural health monitoring (SHM) system.

POSTER: CSC-02

COVID-19 Virtual Test

Victoria Fischer
Faculty Mentor: Professor Matthew Gargano
Department of Computer Science

We created an application that displays a user's likelihood of having contracted the virus COVID-19. Using the React framework with some basic CSS and Bootstrap, the application prompts a user with various Coronavirus symptom-related questions that they must answer to the best of their ability. Comparing user's answers with a scoresheet, our custom algorithm will calculate the user a "score". Depending on how consistent this "score" is to our algorithm, they will display three outcomes. "Low-risk" (inconsistent with our algorithm) will mean they likely do not have Coronavirus but should still follow social distancing guidelines. "Medium-risk" (somewhat consistent with our algorithm) will mean that the user could or could not have it, and it is best to self-quarantine and notify a doctor. "High-risk" (highly consistent with our algorithm) will mean the user has a greater chance of having Coronavirus and should likely contact a doctor as soon as possible. Our algorithm is built with intent to learn and create a feedback loop, helping to further train the AI. The main goal is to provide a way for people to see how their symptoms align with Coronavirus symptoms, and depending on their risk factor, to provide information that best fit the score which they received. This application is in no way meant to be a means of diagnosis or treatment, nor is it meant to be comparable to medical professional's or the CDC's guidelines.

POSTER: CSC-03

Meducation

Jasper Caballero, Jan Markus Milan
Faculty Mentor: Professor Deborah Sturm
Department of Computer Science

We report on a study that investigates whether players, through interactive learning and gaming, can retain information about medications that a traditional pharmacology class would typically introduce. We rebuilt a previous iteration of our role-playing game, Meducation, focusing on the modularity, scalability, and dynamicity of the code structure. This minimized the amount of static data present in the application, allowed for easy addition of more medications, and cut the volume of Unity components by almost 80%. We also added accessibility features such as the ability to have the Non-Player Character's (NPC) speak.

Users are introduced to 20 medications and 10 engaging scenarios involving patients and their respective conditions and are asked to choose the best medicine for the given symptoms. Responses were collected through a pre-survey and a post-survey (after playing the game). The results of this pilot study were promising. The data showed that half of the answers submitted in the post-survey were correct, where the highest correct submissions for a given question was 75%. This trend was seen for most of the assessment questions in the post-survey, averaging to a 60.4% correct submission rate. This was a significant increase in correct submissions compared to the pre-survey, where the rate of wrong or "I don't know" submissions was greater than 75%. The rate of correct submissions in the pre-survey averaged to only 49.6%, showing that after playing the game, there was a 10.8% increase in average correct submissions. These results suggest that game-based learning can be effective when learning and retaining information about medications.

POSTER: CSC-04

Haunted Decoder

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Department of Computer Science

We report on a serious game that assesses a player's ability to perform binary, octal and hexadecimal conversions. This is a topic in computer science that is covered in several courses and is considered one of the fundamentals of computer design and architecture. The game, Haunted Decoder, was created using the Unity engine and C# code. Using the model of a 2D role playing game, many design patterns and tools are applied to facilitate a modern gaming experience. This includes a well-developed story that establishes the plot and describes the characters, setting, and events. There is a major focus on the user interface and user experience. Interactive components are intuitively designed to provide not only entertainment but also help teach the concepts. There are several in-game mechanics that enhance game play and encourage players to complete the levels. These include intro and ending cutscenes which develop the story and makes the playing experience interesting, fun riddles that players can solve as they play through the game, and many UI designs with intuitive visualizations. Additionally, basic game mechanics such as score, number of lives, high scores, and achievements are included. A pilot study was conducted where students took a pre-survey, played the game and then took a post-survey (with feedback on the game experience). About 90% of players liked the gaming experience and about 70% had a better understanding of conversions after playing the game. Most CSC majors commented that it helped them refresh the material on binary conversions and some non-CSC majors reported learning and understanding the concepts.

POSTER: CSC-05

Symmetric Searchable Encryption Scheme – Implementation of a Secure Index

Jacob Chen
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Department of Computer Science

Public cloud computing is when a third-party cloud service provider manages all hardware, software, and other supporting infrastructure for a company. It provides lower costs, no maintenance, better scalability, and high reliability. One of the major drawbacks of using public cloud computing is that storage of sensitive data may not be completely secure. Therefore, companies should encrypt data before uploading to the cloud. However, there are two serious issues with storing encrypted files on a server. First, if one were to search the server for "apples" then the server is fully aware that a document with "apples" may be located on the server. Second, with sensitive data you would normally encrypt the data and then store it on a server. However, once the data is encrypted you can no longer search the server for the content of the documents. You would have to download all the files, decrypt them, then run a search.

The purpose of this project is to develop a secure index that will allow a user to search encrypted data. This is achieved by creating a "trapdoor" when building the secure index. The correct trapdoor can only be created with a private key. The trapdoor then is used as the key to generate a codeword. Finally, the codeword is added to a bloom filter. To search the encrypted data, the user must have the private key. Without this key the user will not be able to generate the correct trapdoor which will also cause the codeword to be incorrect.

To test the implementation, we have a folder of recipes written in plain text. We would read the documents, encrypt them, and transfer the files to an FTP server. Then we would connect to the FTP server, search the encrypted files, and download any files that match the search term.

POSTER: CSC-06

Social Network for International Students

Chukwurado Umeaka
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Department of Computer Science

Studies show that social media can help foreign students adjust to college life in the US by reducing loneliness. International students feel other international students understand the specific challenges they face, and it helped them realize these are not challenges they face alone. There is a need for a social platform for international students and there are very limited resources available for the over one million foreign students. To address this need, I created a social media network, with a job platform, for international students to develop a network amongst other fellow international students and apply for jobs that will sponsor a working visa or accept Optional Practical Training (OPT). In this platform, international students can discover/connect with other international students, share information, chat, view jobs, etc. In building this application, I adopted some of the tools and technologies that are highly used in the tech industry. React is used to build the user interface and Python is used to implement the backend. I also use MongoDB to serve as the database and Google Cloud Platform to deploy the application to the internet.

CURRICULUM AND INSTRUCTION

POSTER: C&I-01

History and Pedagogy: Hidden Connections

Aleena Abraham
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Department of Curriculum & Instruction

The name Edward Hallett Carr is one that is no stranger to those who study history. This well-known British historian published the book, *What is History?*, in 1961 and his body of work remains a topic of discussion in present academia. Carr, throughout his book, positions himself as the interpreter of the past and declares that history is a conglomeration of interpretation of past events. Though Carr's definition of history continues to be challenged with new and emerging ideas, this book serves as the foundation to my study.

Pedagogy, the methodology behind teaching, will be another topic of discussion. Just as history is an interpretation of the past, so too is pedagogy. Educators must continuously interpret the past to make appropriate changes to curriculum. Connections will continue to be drawn between history and pedagogy through inclusion of discussion on secondary sources and ideologies of education theorists, namely, John Dewey, George Santayana, William Glasser, and Abraham Maslow. The psychology, sociology, and philosophy of pedagogy will be discussed through inclusions of small case studies: COVID-19 and its impact on socialization; how pedagogy looks through the eyes of a Student Teacher in the Social Studies classroom; and the hierarchy of needs to promote effective learning in the classroom. This project will serve to answer the specific questions: How does interpretation of history and pedagogy draw similarities? What are the change agents of both and how does this affect our viewpoint on past events and current teaching methods?

My conclusions suggest that pedagogy, like history, is a byproduct of the education community and society as a whole. Both pedagogy and history must be inferred in order to provide guidelines for the future. Change agents within history and pedagogy are society and the teacher.

EDUCATIONAL STUDIES

POSTER: EDU-01

Adolescent Cognitive Brain Development

Susan M. Albarano
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Department of Educational Studies

There are numerous misconceptions about adolescents and why they do the things that they do and feel the ways that they feel. Adults often do not fully understand how an adolescent is developing during this period in their lives. The purpose of this project is to breakdown the adolescent developmental period to explore how this information can be used by educators to better aid and understand their students in the classroom. It is argued that adolescents should not be considered "almost adults," but rather that this period should be recognized as a unique developmental period that requires adult support. It is important to note that adolescent's pre-frontal cortex is not fully developed, and this affects their decision-making, self-regulation and reasoning skills to name a few. Adolescents are reward-focused, meaning that they often focus on the rewards rather than the possible consequences of their actions. Peers have a major influence on adolescent behavior as they often provide the perceived rewards of risky behaviors. If educators understand these and other aspects of adolescent development, they can better engage with, respond to, and support their adolescent students rather than becoming frustrated, which often results in punitive measures.

POSTER: EDU-02

How Can Teachers Offering Choice in their Classrooms with a UDL Framework, Raise Academic Integrity and Honesty in Students?

Angelina D'Aquino
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Department of Educational Studies

Providing students multiple means of expression is a major aspect of a Universal Design for Learning (UDL) framework. By allowing students to have choice in the ways they express what they know, academic integrity and honesty in the classroom will thrive. Students are academically dishonest for a variety of reasons, including lack of interest, pressure to get good grades, peer culture, and time constraints. Offering multiple means of expression can activate schema (bringing in students' outside knowledge and putting things into context) and create more relevance for students within their learning. In addition, multiple means of expression targets the students' learning styles, highlighting each of their strengths and assets. Providing these options to students comes from teachers understanding that there are actions in their power to limit the amount of cheating and plagiarizing in their classes. This project will provide in depth information on why students cheat and elaborate on how teachers providing multiple means of expression in their UDL lesson plans can have an overall positive impact on classroom environment and raise academic integrity in the majority of students.

ENGINEERING AND ENVIRONMENTAL SCIENCE

POSTER: EES-01

Ground Truthing in Staten Island Urban Forests using GPS and GIS Technology to Collect Data for a Plan to Improve the Trails Network

Matthew Wilhelmsen
Faculty Mentor: Professor Jane Alexander
Department of Engineering and Environmental Science

The maintenance of city park and forest spaces is necessary for community wellbeing as well as ecological and environmental health. Parks and trails promote community engagement and physical activity. Natural areas aid the environment by reducing atmospheric heat, air and water pollution. Some problems associated with trail maintenance include erosion related to nature, and man-made issues such as the creation of alternate "social" trails. Invasive plant species, also a man-made factor, work to threaten the natural ecosystems of our urban forests. Natural or man-made obstacles may also impede the quality or access to the trails system.

Ground truthing of trails is the method of collecting information through empirical evidence. It is greatly facilitated by the use of handheld Global Positioning Systems (GPS) and Geographic Information Systems (GIS). These technologies provide an accurate and efficient method to collect data about trail location, attributes, and conditions, and upload this information into a database that can be used for analysis. For this project, ground truthing of the trails located in seven parks of the Staten Island Greenbelt was completed. The data obtained will be used by the Natural Areas Conservancy and the NYC Parks Department to plan and prioritize their trails restoration work.

POSTER: EES-02

Security Sensory Assistive Monitor

Martin J. Alava, Nathaniel Furhang, William Cole
Faculty Mentor: Professor Xin Jiang
Department of Engineering and Environmental Science

Security Sensory Assistive Monitor (S.A.M.) is a senior engineering design project. It is designed to reduce the cost of smart home security and offer more customizability. Through our research, many smart security products purchased from standard vendors have little customizable options and often require monthly subscriptions. Our team's solution is to develop a security system using a central console hub and customizable sensors, providing the user different options for what activates during an intrusion. This system provides an unobtrusive but helpful visual, audible, and haptic warning system. The system is a fully inclusive suite, allowing users to add additional sensors or smart home features.

This project creates a system connecting various entry sensors through a household to a center console. When an entry sensor is activated, it will trigger a connected camera to take a photograph and send out both the photograph and an alert message. After being alerted, the center console flashes a red color, has a text-to-speech announcement of intrusion, and activates a haptic feedback module to make sure the user is notified. The console intends to be as unobtrusive as possible, even aesthetically pleasing, by being equipped with RGB (Red-Green-Blue) lights and a light sensor to dim the lights in darker environments. This system is designed to implement open-source software, i.e. HomeAssistant, and items that are openly available for purchase. The center console is equipped with a Raspberry Pi and communicates with sensors via the open-source protocol Message Queuing Telemetry Transport (MQTT). Reed switches were chosen for the sensors due to their common usage in reactive systems. A camera in conjunction with a Near Field Communication (NFC) sticker verification has been implemented in order to increase security measures on main entrances. This system also implemented cybersecurity and wireless communication standards into its design.

POSTER: EES-03

Intelligent Cat Feeder Project

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About 59% of domestic cats in the United States are obese due to unintentional overfeeding by pet owners. The solution to avoid overfeeding requires flexible feeding systems. Our Intelligent Cat Feeder project implements customization options that allow users to register cats and custom tailor a healthy diet to each cat. Each cat will have its own individually calculated portions of food. The owner will be able to keep track of the cats' diet progress.

The Intelligent Cat Feeder consists of a food dispensing system, a food reservoir, a cat registration and identification system, and a settings navigation system. The food dispensing system uses servo motors to dispense food onto a 3D printed bowl. Load cells increase the accuracy of the amount of food dispensed. Radio-frequency Identification (RFID) tags are used to register and identify the cats within the system. The RFID tag uses low frequency radio signals to transmit tag-specific information to a microcontroller, allowing us to generate and view specific profiles per cat. The navigation system uses buttons and an OLED display to maneuver and adjust the settings menu.

Examples of a few key features developed for the intelligent cat feeder are: The user can input the Minimum Energy (ME) value unique to specific foods and have the system automatically calculate the daily caloric needs of a cat based on its current weight. The setting navigation system allows the user to manually adjust different aspects of the feeder and organizes the information for the user to make modifications. A logging system is used to store the daily intake and weights of cats, which will monitor the progress of cats' health.

POSTER: EES-04

Outdoor Weather Station

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The goal of this project is to design a cost effective and portable outdoor weather station that measures temperature, humidity, wind speed, and detects flame and gas (CO). Study and monitoring weather is important because it shapes peoples' lives. However, it is difficult to obtain accurate weather data in the wild forecast, especially in rural areas.

This project is to develop a system for intelligent weather forecast and natural disaster prediction (eg. wildfires). Our outdoor weather station system consists of two main subsystems: distributed sensor nodes which can be deployed in different locations to gather weather and ambient information; and a central controller where all sensor node information is processed and displayed for operator. The sensor node is equipped with different types of sensors: temperature sensor; wind sensor; humidity sensor; flame detector; and gas detector. Each sensor has been characterized and corresponding alarm thresholds for fire disasters and storms will have been identified. The sensor node information will be transmitted to the central controller wirelessly. The data communication is built upon LTE cellular network for better communication coverage in outdoor applications. The central controller runs a web application with cloud infrastructure to process sensors information. The cloud web application is developed based on Partical ide software and it can display the location of sensor nodes, as well as real time temperature, humidity, and wind speed at each sensor nodes. It can also display alarms whenever the flame or carbon monoxide are detected.

POSTER: EES-05

HUD Helmet

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The goal of this project is to implement a heads-up display (HUD) into a Helmet. The HUD Helmet is intended for use by motorcyclists as well as bicyclists. This helmet will include multiple features to increase safety and is also user friendly. These features include a heads-up display that primarily shows blind spot detection, time, and location, as well as other important features. It will also include a very small OLED display that can show information while not being obstructive to the driver. A GPS module will be used to track the position of the wearer and use it to display relevant information onto the HUD. This display will also provide a visual cue if an object is approaching the blind spot of the wearer as measured by the Ultrasonic Distance Sensor. This sensor uses sound to measure the distance up to 13 feet and will trigger a visual cue on the HUD and the audio cue by a buzzer to alert the user if something is in their blind spot. The components for this project will be mounted using adhesive designed to detach in case of an accident as well as complying with current safety standards. The cohesiveness of the HUD Helmet system improves the safety and convenience factor of the user.

POSTER: EES-06

Controlled Robotic Arm Synchronized With 3-D Prototype Glove

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Robotic arms can be used for a variety of different purposes especially in today's automotive industry with automation on the rise. Whether it's constructing a car or working the assembling line, automation allows for an expedited process with less human intervention involved. In this project, we designed a prototype that allowed the user to use a customized glove to control a robotic arm. The robotic arm was synchronized with the customized glove in order to perform certain actions. The user wearing the glove was able to move his finger and wrist up and down, and his forearm sideways while seeing the same kinds of movements performed on the robotic arm. This 3-D printed glove consists of a bracelet and a customized finger on top of it with built-in sensors. These sensors record measurements every time the user moves his glove and send the data to the robotic arm via a wired connection to turn the motors. The motors are located in 5 different areas on the robotic arm with two motors located at the waist, two at the elbow and one at the claw. The sensors on the bracelet control the claw, and the sensors on the controller's forearm and wrist control the waist and the elbow of the robotic arm, respectively. As the user moves his forearm and wrist while operating the glove to accomplish some tasks, similar movements are seen and performed by the robotic arm. Overall, the robotic arm, which was paired with our customized glove, was capable of moving objects from one destination to another and typing sentences on a keyboard.

POSTER: EES-07

Parallel Parking System

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Parallel parking is a part of driving that 34% of drivers claim to struggle greatly with. Even worse, 50% of drivers state that if they have to parallel park they will continue to drive and not park at that location. Furthermore, 8% of drivers claim to have hit other cars while parallel parking. Creating an improved parking system would allow drivers to feel more confident parking when having to parallel park. The goal of this specific project will be to allow drivers to be able to park cars faster and with more ease. The design objective of the parallel parking vehicle is to combat the problem of drivers who struggle with the technique of parallel parking between two cars. This idea will be implemented by rethinking a standard vehicle steering system. This system will allow all four wheels to turn at a 90-degree angle and simply allow the vehicle to slide into the desired spot.

POSTER: EES-08

Smart Street Lighting System

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Existing street lights are antiquated and need great enhancements in order to help improve precise detection of pedestrians around them. More and more steps need to be taken to help conserve energy and expand grid connections.

Some of these measures can help improve our day-to-day life on the streets that are greatly affected by the efficiency of street lighting systems. We developed a system that can sense pedestrians within a 35 feet array and as these pedestrians walk out of range of this array the lights start dimming until another person or group of people get in range of that array of light. These can work both ways for one person or a group of people going in both directions as long as it is within a 35 feet array that the sensor can sense them. Our improved street lighting system is not meant for an individual street light the way we programmed it but is part of a system meant to operate for an area with a series of street lights. This system can help conserve energy and make it more efficient for our community

POSTER: EES-09

Fluffier Rice with Optimized Heating Cycle

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Rice cookers are an essential part of many cultures producing an easy and affordable meal. While there are traditional techniques to tackle the golden ratio of rice to water, our project tackles the concept of creating perfectly fluffy rice by incorporating an Arduino microcontroller that will control the heating cycle of the rice cooker by closely monitoring the internal temperature. By utilizing a frequency modulation circuit to actively read the frequency across a negative temperature coefficient (NTC) thermistor touching the surface of the rice bowl, the Arduino will monitor the cooking temperature. An NTC thermistor is a resistor that decreases in resistance as temperature rises with accurate measurements up to 0.2°C. When the Arduino detects that the temperature has reached boiling point 100°C, a relay switch connected to the source plug will activate. The Arduino will then deliver pulse width modulated (PWM) signals to the relay switch controlling the rate of power entering the rice cooker. PWM is a series of on/off duty cycles that regulates the total percentage of power a circuit receives. By experimenting with different duty cycles, the aim is to operate at a heating cycle that produces the fluffiest rice.

POSTER: EES-10

Depression Detector: Detecting Depression Using Vocal Features

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Department of Engineering and Environmental Science

One of the most significant challenges of depression is its invisibility and ability to go unnoticed during a person's lifetime. While searching for a resolve for this issue, researchers found a correlation between a person's mental health status and vocal features. The Mel Frequency Cepstral Coefficients (MFCC) are coefficients that make up the Mel Frequency Cepstral (MFC); they characterize the change in frequency with time. This method is commonly used in signal processing as a feature extraction tool when analyzing a person's speech signal. The study, which provides the basis for this project, concluded that three vocal features played a significant role in potentially detecting depression because they were all significantly higher in healthy people when compared to depressed people. These three features are loudness and the Mel Frequency cepstrum's fifth and seventh coefficients (MFCC 5 and MFCC 7). This project aims to design a system that uses software to analyze and measure vocal features based on voice recordings of people reading passages. The analysis is expected to detect if the person is depressed using the measured values of the MFCC5, MFCC7, and loudness. Our methodology includes three group members recording themselves while reading three separate paragraphs. Each paragraph was chosen to trigger a different emotion: positive (happy), neutral, and negative (sad). The software was then used to extract the vocal features specified. We discuss the patterns found between loudness, MFCC5, MFCC7, and depression based on our recordings.

POSTER: EES-11

Improving User Interface for PC Gaming

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In today's world, there are about 1.8 billion gamers with most of them being PC players. A major problem that many PC players face is having cold hands while gaming. With competitive gaming, there is an increase in adrenaline which causes blood to flow to our vital organs which results in cold fingers/hands.

The current gaming interface just applies heat to the hands. To improve on the current design, we looked at how temperature affects one's gaming performance and to see what optimal temperature corresponds to optimal performance. This was obtained by using the mouse accuracy website which determined that the temperature does affect the user's target efficiency and click accuracy. Furthermore, linear regression was used to obtain an equation that relates the performance to the specific temperature.

This equation is implemented in our design which uses a pre-existing heating mouse apparatus and adding our own interface and controller with the obtained equation that would let us adjust the temperature to the optimal one (the higher the temperature the better efficiency).

Our design uses a temperature sensor that measures the user's hands and this information is sent to the controller which would then implement the equation for optimal performance based on the user's hand temperature. If the temperature of the user's hands is low, the heating apparatus will turn on and increase the temperature to the optimal value.

POSTER: EES-12

Improving Ventilation Systems

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COVID-19 has been a widespread virus for over a year. The most effective way to control the spreading of this deadly virus is to improve ventilation systems so that people would be able to be safer in closed spaces. Using a filter that normally blocks out pathogens as small as microns and install those filters into a ventilation system is our goal. Our system will consist of a fan that pushes air through a filter with a specific amount of energy. The Healthy Buildings program recommends roughly four to six air exchanges per hour in the average room, through any combination of ventilation and filtration.

We plan to measure the change in pressure across the filter as well as the airflow. These measurements will be taken before and after placing the filter which will help find the extra energy needed to push air through a filter. We took the size of the pathogen for COVID which is 0.12 microns and compared it to a N-95 face mask filter which protects pathogens up to 0.1 microns meaning the filter will be able to capture these pathogens. On a larger scale, we will use different MERV rated filters like MERV-13 which will be compared to cheaper rated filters. When adding a fan, it will significantly help capture these pathogens in a ventilation system. The fan required to push air through a filter will help determine how well these filters will perform. We will continue to measure the extra demands associated with the extra energy needed to push air through a filter.

POSTER: EES-13

Maximum Power Point Tracking of Photovoltaic Arrays

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Climate change is potentially one of the biggest threats to prospects of civilized human life. There are many methods to harvest electrical energy. Solar is one form of energy that can be converted into electrical energy and it is abundant in its nature. Maximum power point tracking is a technique that enables us to optimize the collection of solar energy. In our project we are utilizing two independent solar panels; a larger panel will capture the sun's

energy, and a smaller panel will collect data and monitor conditions in real time. Using the fractional open circuit voltage method, we will estimate the maximum power point of the cycle. This is done by altering the larger panel's voltage until it is equal to the maximum power point voltage calculated by the microcontroller. This voltage analysis is done by either raising or lowering the duty cycle based on external conditions. After changing the duty cycle, a feedback loop will occur and this process will be repeated. Finally, using a DC to DC converter we will step-up the voltage to charge a battery. In larger scale operations there would need to be higher rated equipment for testing high voltages, as well as for higher power conversions. All in all, our hope from this project is to aid in the combat against climate change by making solar energy an efficient and integral part of our energy needs.

POSTER: EES-14

Detecting Lead in Water

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Lead metal is very harmful for human beings as it is the cause of many serious diseases. This project aims to improve the method used to measure the concentration of Lead in drinking water. The project is divided into two parts. In the first part DPV (differential pulse voltammetry) method is used. DPV is a method that measures varying levels of voltages across electrodes and the resulting current that flows through the electrolytes. Samples are taken over a certain period to establish the relationship of voltage potentials (E), current (i), and time (t). Differential pulse voltammetry is preferred because its differential nature helps to minimize the effect of background charging current during analysis. The short pulses make the technique highly sensitive, which gives it the accuracy advantage of at least one part-per-billion during an analysis. The highly-sensitive nature of differential pulse voltammetry makes it a useful chemical analysis method in real-life scientific applications. In the second part, the Arduino is used to improve the signal, which means the sensitivity of the device, then demonstrate the number of Lead ions on the serial monitor. For this purpose, the Lead detecting electrode is attached to the analog input of Arduino and after that a code is written to transmit the data received on analog input of Arduino. This will be displayed by the serial monitor. Overall, the project's goal is to produce a device that detects lead in water levels higher than 5 ppb when the EPA standards for lead in drinking water is 15 ppb.

POSTER: EES-15

Lift Assist

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Most people will develop back problems at some point in their life and some will develop knee problems. "Lift Assist" is a device geared towards avoiding those problems from developing in the first place and preventing damage to the body. This is done by creating a lifting mechanism, in the design of a scissor lift, using a threaded rod and stepper motor to drive it up and down. This lifting mechanism allows a platform to be raised to a desired height that is ideal for the user. The current prototype can achieve a lift of 1 foot 7 inches from its initial position which is about 1 foot 4 inches off the ground. In the future this design can be modified to reach higher. The raising platform eliminates the need for the user to bend over. The platform can then be lowered and the cart can be rolled to a desired location ready to be unloaded. Using this system prevents an injury when someone picks up and carries a load, possibly damaging their back or knees.

POSTER: EES-16

Intelligent Fog Machine Controller

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Department of Engineering and Environmental Science

Fog machines are the devices that produce glycerin fog. They are widely used for bars, concerts, festivals, weddings, and museum exhibitions to develop the perfect environment for the light show and specific atmosphere. The best controller on the market offers simple time-based fog production control. Fog machine controllers were invented to maintain some amount of fog while the host is away, rather than to control actual fog in the air. Even the most expensive and advanced controllers do not monitor how fog is produced or how much fog is already in the air. Measurements proved that air quality must be considered during fog control analysis. We have invented an intelligent fog controller that takes samples of air in order to calculate the amount of fog to be produced. The latest version of the controller has multiple bonus features, such as music analyzation, and external outputs for additional light fixtures and other devices. The controller was built using low-cost components bringing the cost down however kept the quality, hard metal casing and many safety features.

ENGLISH

POSTER: ENG-01

How the Drowned Become Water

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How the Drowned Become Water is a play (divided into 2 Acts) that focuses on the lives of Egypt's fishermen community. The project is formatted as an intellectual play (a term coined by Arabic playwright Tawfiq Al-Hakim that means a dramatic style of produced plays that at its inception is intended to be read rather than performed) and is focused on using poetic language/description, a heightened sensory environment, and the usage of the literary technique magical realism. The plot of my play revolves around the intersection of two lifestyles of people: Leila, Ramy, and Eman (a poor family making their living fishing on the Nile) and Musa (a middle-class fish smuggler). The play explores the grief of Leila's family due to the sudden and unexpected suicide of her older brother, and the implications of that action on their lives. Musa, the other plot of this story, has become wealthy through smuggling fish from Aswan. And due to this, he begins to explore American art, music, and literature and yearns to travel and acquire the 'American Dream' for himself. While very different lives are at the center of the play, the play looks at aspects of Egyptian life and community that haven't been explored too greatly within the literary/theatrical form. At its essence, the entirety of this piece is a memory and plays out as a memory play (such as The Glass Menagerie). The culmination of two independent studies, I have been conducting research that involves reading articles and journals, watching documentaries, and researching specific individuals that are affiliated with aspects of life within Egypt's Nile fishermen community. This has helped strengthen the authenticity and specificity of my characters, imagery, and settings. It also helped flesh out aspects of the Egyptian lifestyle: culture, traditions, clothing, food, etc. At the conclusion of my project, I have produced an intellectual play that while intended to be read, can also be performed on stage. Utilizing the poetic language, I will showcase a public presentation that addresses the main themes of my research/play including the lives and grief of fishermen living in the Nile, the sacrifices taken to achieve the American Dream, literary influences, the writing process, and the property of magical realism.

POSTER: ENG-02

Not So Nonsensical: Exploring Lewis Carroll's Representation of Victorian Childhood in Alice's Adventures in Wonderland

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Department of English

The purpose of this project is to analyze Lewis Carroll's representations of Victorian childhood in his novel, *Alice's Adventures in Wonderland*. This project is a close reading of the novel, examining how the novel depicts and critiques Victorians' beliefs about childhood and their attitudes towards children. It also considers how Carroll's intimate relationships with children may have informed his empathetic position toward, and depiction of, the Victorian child. Additionally, this study argues that Alice's interactions with the fantastical creatures in Wonderland represents the fraught relationships between Victorian adults and children. This project also places the novel in its historical context, to illuminate how the novel is shaped by, and responds to, Victorian England's notions of gender, social hierarchies and class, and familial values. The purpose of this is to show how Carroll's empathetic view of children often clashed with the pervasive contemporary belief that children need strict guidance to become well-mannered adults.

ENGLISH/LINGUISTICS

POSTER: ENG/LING-01

The Syntax and Semantics of WH-marked Yes/No Questions

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This study is part of an ongoing investigation into a construction we call WH-marked Yes/No questions (WHYN). WHYNs are found, perhaps exclusively, in the New York City variety of English (NYC English). An example of a WHYN is shown in (1):

(1) What am I? George Washington?

Previously we have established the following about this construction. First, it is clear that WHYNs are not genuine questions, i.e., they are rhetorical rather than actual requests for information. Second, they seem to imply that the speaker believes that the hearer believed the answer to be "yes" (even if the speaker understands the question to be "no"). Third, although a common use of these questions includes a sarcastic connotation, sarcasm is not a central part of their meaning. The WH-component does not seem to be pronounced like a genuine WH-question. Finally, these questions have a particular role in forming the stress patterns within words and phrases and this realization is the main focus of the present study. In particular, we contrast and compare the prosodic characteristics of WHYNs and standard WH questions in an attempt to verify previous observations about how they are pronounced. Our analysis will be based on the corpus, used previously, of spoken NYC English constructed from episodes of the television show Seinfeld. Our discussion will focus primarily on stress patterns, and on the WH-element rather than the Y/N-element.

POSTER: ENG/LING-02

The Role of Autistic Traits on Acoustic Measures of Vowel Intelligibility in Male and Female Speakers

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Previous research has shown that measures of speech production and speech perception vary systematically in relation to autistic traits, i.e., characteristics of the broad autism phenotype that exist in the healthy neurotypical population. Recent research also shows a well-established pattern in clinical populations that the measures of neurotypicals, healthy people who have autistic-like traits — especially those related to pragmatic communication — are correlated with weaker lateralization, a language processing in the brain. In the present study, we continue investigating the role that autistic traits play in speech production in communicative contexts. We are testing the hypothesis that vowel distinctiveness, acoustically defined, is systematically and inversely related to autistic traits. A large group of native speakers of American English produced words containing four corner vowels i,ɛ,ɑ,u, from which we calculate measures of vowel dispersion. We continue to consider the possibility of differences related to sex/gender, as autistic traits have sometimes been found to have a strong correlation for women's speech.

HISTORY

POSTER: HST-01

Nationalization and German Folklore: The Politicized Education of German Women in the Third Reich

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This project explores how folklore played a large role in the nationalist thinking of 19th century Germany and later the "German" culture that was revisited and radicalized by Hitler and the Nazi Party in their methods of indoctrinating young German women and further expanding the National Socialist movement. While there are many aspects of "ancient culture" used by the Nazis politically, these "moral" ideals were largely centered within programs such as the Bund Deutscher Mädel. The BDM, or League of German Girls, was a female branch of the Hitler Youth organization. Founded in 1930, it emphasized the ideas of building a "New Germany," embodying the values of an "Ideal German Woman." The main question to consider is why the Nazis used youth programs such as the BDM to implement these ideas and to what degree they relied on folklore in doing so. Many folklore traditions can be traced back to the Brothers Grimm, most famously known for collecting and publishing formerly oral tales into written folklore for the growing literate population in the early 19th century. Their work served as a cultural link to unite a "German" people by embodying a romantic and ideal concept of the German Volk. Various secondary and primary sources are analyzed for this research project, including books, manuscripts, academic articles, personal statements, letters, translated songs, stories, program guides, printed materials such as photographs and pamphlets, as well as organizational documents declassified by the Office of Strategic Services and other government agencies.

MANAGEMENT

POSTER: MGT-01

Impact of the Covid-19 Pandemic on the Jersey Shore BlueClaws

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Department of Management

The purpose of this case study is to analyze the decisions and actions of the Jersey Shore BlueClaws before, during, and after the Covid-19 pandemic. The BlueClaws are a Minor League Baseball team affiliated with the Philadelphia Phillies. The study provides a look into the traditional business model of the BlueClaws built around entertainment and hosting events from a financial, logistical, and psychological perspective. It then describes the actions of BlueClaws' management in anticipation of an announcement by Minor League Baseball that the 2020 season would be cancelled. The case focuses on how the Jersey Shore BlueClaws prepared to communicate with their stakeholders and planned for multiple scenarios for the 2020 season.

POSTER: MGT-02

College Athletes Should Make Money off of Image and Likeness

James Petruccio
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There has been a debate for the longest time over this, but College athletes shouldn't be paid. Yet, they should be able to make money off of who they are and their likeness nationwide. College Division 1 sports are watched and loved just as much, if not more than Professional sports. They are all playing the same game with the same risk of life-threatening injury, but the only difference is that these college athletes are playing without any benefit besides playing the sports they love. They receive nothing in return for shining bright lights on the colleges and universities nationwide that they end up choosing to attend. People spend money to watch these highly touted athletes at their schools, and they won't even allow them to be making money off of sponsorships or anything based off of their image and likeness. It's a crime that these athletes are treated like this and should finally be on the reimbursing end of it for all they bring into these schools.

POSTER: MGT-03

Leadership Styles Effect on Employees' Work Ethic

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Leaders may have the expertise required to articulate the purpose of the company. With the proper leadership skills, leaders can implement techniques to develop employees' abilities. Factors, such as greater work satisfaction, increased productivity and a desire to succeed in personal success is the kind of encouragement a leader's influence can have on employees' motivation and work ethic. For a company and its workforce, motivation is critical. With the guidance of a leader's motivation, individuals can meet expectations and personal objectives. Leadership can be expressed in many ways; however, my study draws attention to the five most common leadership styles with the most efficiency. Directive, transformational, servant, democratic and authoritative leadership may all influence an employee's success and performance. Focusing on these five types of leadership styles gives a clear understanding on how the development of a culture of consistency, inspiration, inclusion, creativity, and compliance can have a positive effect on the performance of an employee. Using my experience as the main focus of this study, I will emphasize which leadership style is best suited for promoting job performance and success.

POSTER: MGT-04

Management in the Age of Millennials and Gen Z

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The world of business is always changing and management techniques need to do so as well in order for companies to stay competitive in the global marketplace. Millennials and Gen Z, starting to dominate the workforce, have different expectations than someone with traditional management views. Millennials desire to have a greater impact on an organization and Gen Z's are tech savvy team players, beneficial to organizations. It is important for management to have the capability to bring out these traits rather than trying to coerce Millennials and Gen Z to fit the norms of management from the past. Adapting to the needs of newer generations can increase worker productivity, lower employee turnover, increase job satisfaction and enable innovation. Tesla, Google, and Apple, are examples of businesses that have thrived because of their willingness to incorporate the needs of these two generations into their management practices. In the study I will look at how Millennial and Gen Z needs can be better integrated into an organization's operations. A roadmap on management practices is developed for organizations to apply to the demands of the new marketplace.

MARKETING

POSTER: MKT-01

Chatbot for Eldercare

Cindy Rong
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Department of Marketing

As the population of older people increases, eldercare will need more resources; especially, with an eye on physical, mental and emotional well being. The elderly often lives with chronic diseases and may go through medical episodes. The technology innovations in healthcare for the elderly patients, such as continuous monitoring apps, can provide in-time alerts and rapid response to the medical emergencies. In this study, we investigate the medication reminder and events reminders to the independent living adults to ensure their on-time medications with the right pills or dosages, as well as to allow them to participate in many hobby and family events available for them. In order to overcome the interface with computers or mobile phones, which can be a barrier for them to use the technology innovations, we designed the voice driven interface with the customized chatbot with emotional empathy.

By engaging the chatbot, this population segment can create the medication reminders or their needs as the chatbot can also retrieve reminders and events. This eldercare chatbot reminder system is designed to connect with existing popular apps according to the process needs on the Web Integration platform, which enables even non-technical users to easily configure their process. The chatbot was designed to be as human-like as possible by having the feature make facial expressions after specific phrases of words that closely align to human emotions. The chatbot conversational model is designed to ask the necessary questions for user input, and recognize and perform the intent by either creating an event or a medication reminder. The prototype system uses apps such as the Google Calendar or a Google Sheet to store events or medication reminder schedules.

POSTER: MKT-02

Digital Marketing During COVID-19: Consumer Shifts in the "New Normal"

Corina Gerbino
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Department of Marketing

The ongoing COVID-19 Pandemic has changed the world entirely. It affected almost every industry including the marketing industry. A major change in the marketing industry that happened due to COVID-19 is the shift to digital marketing. During the last decade, before the pandemic started in 2020, traditional marketing strategies (e.g. television, radio, billboards, print marketing, etc.) were fading, but they were still effective enough to work. However, during the pandemic, digital marketing including email marketing, social media marketing, search engine marketing, and mobile marketing and etc. largely increased and started to replace traditional marketing. This study is a literature review which focuses on the shifts in consumer behaviors and thus the emerging marketing opportunities during and post the COVID-19 pandemic. The unprecedented nature of this pandemic has caused many profound changes, some of which have important implications for marketers who are trying to build lasting relationships with customers. With a large population working online, buying online and spending more time online than usual, marketers will need to think hard—and differently— to respond to a new stage of economic recession and how to engage consumers in the “new normal”. The findings of this study seek to help marketers identify areas where they can improve in the age of Covid and offer recommendations on their future marketing strategies.

POSTER: MKT-03

The Battle Between Poland's "LGBT ideology-free" Zones and the European Union as a "LGBTIQ Freedom Zone"

Skyler Labetti
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Department of Marketing

Many regions in Poland are now passing anti-LGBTQ laws that restrict homosexual couples from having the same rights heterosexual couples have. These laws are encouraging certain areas of the country to label themselves as "LGBT ideology-free" zones and promoting discrimination towards LGBTQ+ people. The result is an entire minority group's rights and safety being put in jeopardy.

On March 11th, 2021, the European Parliament declared the European Union as an "LGBT freedom zone," hours after the Polish government announced plans for a more thorough approach to their previous adoption ban. While the events of this dispute between Poland and the EU on the human rights of LGBTQ+ people are still ongoing, this study will aim to summarize the current scenario. How Poland's actions violate human rights will also be analyzed and compared to past U.S. scenarios from a business perspective.

MATHEMATICS

POSTER: MTH-01

Math Performance in Relation to SES

Richard T. Sciarrino
Faculty Mentor: Professor Gunter Fuchs
Department of Mathematics

I will provide an in-depth look into how a student's socio-economic status factors into how they perform in the classroom, as well as identify numerous ways to elevate the performance of students who are struggling. I have chosen this topic because in my future career teaching high school mathematics, I will need to be aware of these factors and how to effectively help those students to succeed in my classroom. After my research, I have developed a lesson plan on the topic compounding continuously for an Algebra 2 class. This lesson plan will address the needs of students with various SES's, thus fully engaging the students in my classroom and ensuring their understanding of the topic.

From my research and my personal experiences, I observed students giving up on a math class due to their lack of knowledge and unpreparedness of the topic. A student's low SES is a significant factor in their unpreparedness in the classroom because of the associated factors that come with a low SES. These contributing factors include but are not limited to, living in an area with high crime, living in poor conditions, a one parent household, or a student having a job to help support their family. I will also compare and contrast how different countries teach mathematics. Drawing on various methods and strategies, I strive to form a learning environment and lesson plan that take into account students' different needs and SES.

MEDIA CULTURE

POSTER: MC-01

Environmental Justice and Media Narrative: Fresh Kills Park's Rise from the Ashes

Vincent Villani
Faculty Mentor: Professor Cynthia Chris
Department of Media Culture

From a landfill to a thriving natural beauty, Staten Island's Fresh Kills Park has become a model of environmental recovery and a paragon of hope for those who advocate for environmental justice. Throughout its history, Fresh Kills Park has made constant use of available media to achieve change and environmental justice. Using the power of media narrative, community organizations such as the Freshkills Park Alliance, continue to help the park through efforts to keep Staten Island conservation minded. Through various media, the Freshkills Park Alliance attracts people of all ages to attend workshops and events held in the park, all aimed at increasing awareness of the natural beauty that lies beneath the titanic cityscape of New York City.

Even with multiple media platforms at their disposal and a sizable audience, however, the Freshkills Park Alliance still faces challenges in reaching the wider community. The Fresh Kills site was a blight on New York City for so long it can be hard to convince people that it has changed and is now beneficial to the community. To account for this, the Freshkills Park Alliance utilizes different strategies on the internet and social media to draw their audience's eyes to their content.

As part of my research, I am investigating the history of Fresh Kills Park as a site of transformation and its current function as a place of environmental growth. Drawing from interviews with Fresh Kills staff and my own experience as a communications fellow, I will also be demonstrating how this community space utilizes its website and social media to reach out to their audience and promote conservation to the community.

POSTER: MC-02

The Cultural, Political and Social Impact of Video Gaming

Adam Blyth
Faculty Mentor: Professor Emma Johnson
Department of Media Culture

This project traces the impact of real-life allegations of misconduct on virtual fan communities. Fandoms have emerged as a site of participatory digital culture, especially within the last decade. The web is a place where teens turn to when they can't find people in real life to share their interests with. Often, they see themselves as different from everybody else. In the modern era, these fandoms have grown much larger & more inclusive, and it has an undeniable importance to individual identities. The normalization of sexual misconduct and misogynistic behavior is prevalent within communities such as "Smash Bros." Last July, a series of allegations arose about this community's top players. Given the progressive messages of video games like "Final Fantasy," a game which many "Smash Bros." players also have played, one would expect the fan culture of these games to embrace similar social values. However, patterns of misconduct and mistreatment of women are just as common within these communities. As Suzanne Scott, author of "Fake Geek Girls" demonstrates, highly visible fan cultures tend to gatekeep their spaces. Allegations of sexual harassment and abuse of minors are of course not unique to gaming fandoms. Many recent cases involving prominent coaches and priests have helped victims to come forward - lending evidence to the idea that fandoms aren't as different from everybody else as they may believe. Overall, it's further evolving that these fandoms aren't as severed from the real world as they believe. Drawing on personal experience as a former member of the "Smash Bros." fandom, I have a unique perspective on how these people treat each other and talk about women within their spaces. This research also draws on social media texts created by fans and shared publicly, using the story of a scandal within the "Smash Bros." community to demonstrate how virtual fandoms are challenged by their growing size and the spillover of social movements such as "#MeToo." Video game allegations are as real and as serious as other social scandals, turning a blind eye to these things because of how non-seriously video games are taken has led and will continue to lead to the normalization of these behaviors.

POSTER: MC-03

Representation of the Deaf Community in a Digital Age: Social Media as a Cultural Tool

Veronica P. Pistek
Faculty Mentor: Professor Edward Miller
Department of Media Culture

Social media has become widely available in the last ten years and has an increasing impact upon many marginalized group's modes of expression and communication, including the Deaf community. Scholars in Deaf Studies have begun to examine the accessibility of social media, in terms of how easy it is to access information and communicate as a deaf person online. However, even as the awareness of minority groups begins to increase online, the Deaf community still struggles for recognition and acceptance as a cultural/linguistic minority.

This project examines various aspects of Deaf culture, including communication issues, how societal issues are represented in social media posts, and how social media sites potentially enable the exploitation and silencing of Deaf culture. An analysis of ASL history, the Deaf community, along with research into the accessibility for Deaf users on platforms like TikTok, Instagram, YouTube, and Twitter are explored to gain an understanding of how social media acts as a cultural tool for and against Deaf users. Questions of online discourse and advocacy are explored, as well as an explanation as to how audism (anti-Deaf discrimination) exists virtually, since it is deeply rooted in our hearing-dominant culture. A further look into how Deaf people are represented and perceived in different forms of social media by others is also presented through a qualitative methodological approach. Ultimately, the Deaf community has a platform to express themselves as never before, bringing advantages and disadvantages to those whose native language is ASL. While there tends to be a shift in minority advocacy on social media over the course of the last year, hopefully these sites will work toward supporting and highlighting Deaf creators.

POSTER: MC-04

The Influence of Covid-19 on Social Media and Society

Ilia Krisulas
Faculty Mentor: Professor Reece Peck
Department of Media Culture

Change in society is accelerating and the progression of mobile technology has provided an effortless development of online platforms including such social media applications as Facebook, YouTube, and Instagram. Through mandatory quarantining and social distancing, our country has faced new societal obstacles that have challenged our communities.

Social media has provided people with an outlet to connect, share, and receive information through these dire times and not only has covid helped the growth of social media, but social media has influenced covid as well. These interactions have a negative reaction on society but at the same time there are positive aspects as well that have seemed to go unnoticed.

For my project, I will be producing a short video representing the impact COVID-19 has had on social media and society. The objective of the video is to inform the audience of the different influences that covid has had on society and how social media plays a big part in it. To start, I will be researching the developments of the virus from its start to the present and how it coincides with the emerging social media platform known as Tik Tok. I will be using multiple cinematic techniques throughout the video in order to portray how individuals coexist with social media during the pandemic. People of different demographics will be used as subjects to better understand how the impact changes with each person.

VIDEO: MC-05

Pandemonium [video presentation]

Emylia Benavente
Faculty Mentor: Professor Tara Mateik
Department of Media Culture

After missing a night out of partying in the woods, Anna notices that her friends are suffering from strange afflictions: hearing voices, vivid dreams, and manic behavior. Pandemonium, is a mythical thriller that awakens a wrathful forest figure when his alter is vandalized.

https://youtu.be/ObidUsqsLO0

VIDEO: MC-06

The Hero's Journey in the Modern Day [video presentation]

Hector Campo
Faculty Mentor: Professor Tara Mateik
Department of Media Culture

Inspired by Joseph Campbell's Monomyth, The Modern-Day Hero's Journey, is a short film about the mundane routine of a "successful" life. Today's hero is captive to a Sisyphean job. Each day is regimented and without purpose. Wake-up, commute, work, eat, and sleep on a loop. His life is stripped of all purpose and meaning.

https://youtu.be/oIMGzx2E_Vo

NURSING

POSTER: NRS-01

The Role of Nurses in the COVID-19 Vaccination Effort

Sara Filip
Faculty Mentor: Professor Regina Gonzalez-Lama
Department of Nursing

The purpose of this project is to research and gain an understanding of the impact and influence that nurses have on the ongoing vaccination effort against the coronavirus. In regard to the current unprecedented times, the COVID-19 pandemic has shocked the healthcare system. Nurses have always been on the frontline, playing a critical role in crisis management. In order to understand how the roles of nurses are changing, and in what ways they are affecting public health, a review of past and current nursing responsibilities is necessary. The literature review will examine the following topics: COVID-19 vaccination rates compared to vaccination rates of other infectious diseases; the public's perception of vaccines; public perception of the nursing profession; and nursing recruitment and involvement in the vaccination effort. An additional facet of this project will be participation in an international virtual exchange between four higher-education institutions. Following a presentation about the COVID-19 vaccine, a discussion between participants from all the schools will provide first-hand accounts of how nurses in different areas of the world perceive their role in the vaccination effort. The information gathered through the review of literature and participation in the exchange will create a foundation for examining how nurses can increase vaccination rates following the COVID-19 pandemic.

POSTER: NRS-02

International Virtual Exchange Program: Fostering Global Health by Forming Intercultural Partnerships

Ariana Moy, Mary Fowokan, Tara Gerbino, Alexarae Pomaro, Sara Filip, Camille Ponce
Faculty Mentor: Professor Regina Gonzalez-Lama
Department of Nursing

The need to establish an international network to promote global health is more evident now than ever before. In an effort to promote health equity and wellness for all people, the International Virtual Exchange Program (IVEP) was designed to enrich student's personal and professional identities by providing an interdisciplinary transcultural experience. Faculty as well as peer-to-peer discourse was initiated on topics such as approaches to intercultural health and professionalism, disaster preparedness, first aid psychology, as well as convergent and divergent experiences through the COVID-19 pandemic. The aim of this program is to build a platform on which a community of practice can be formed for future collaborative programs addressing global health and wellness.

Program Objectives

1. Lectures provided by faculty will address topics in Global Health.

2. This international virtual exchange program will be the forerunner for in-person study abroad (when available) for Bronx Community College students, faculty at UNIBE, College of Staten Island, and Texas University.

3. Students will develop a peer-to-peer mentor and network relationship.

4. Students and faculty will apply as well as increase their digital communication skills through this virtual cooperation.

5. A community of practice will have been formed for further collaborative programs.

POSTER: NRS-03

Sudden Infant Death Syndrome: Can We Reduce The Risks of Infantile Tragedy?

Alexarae Pomaro
Faculty Mentor: Professor Regina Gonzalez-Lama
Department of Nursing

Sudden Infant Death Syndrome (SIDS), the sudden unexplained death of an infant under one year of age, is a tragedy that afflicts millions of families every year. In the United States, SIDS is the third-largest cause of infant mortality, preceded by only preterm birth and congenital anomalies. This study will cross-analyze peer reviewed articles to explore the inexplicable prevalence of SIDS in the general population. It will also seek to distinguish trends across subpopulations and differentiated lifestyles. Specific consideration will be given toward the occurrence rate of SIDS as well as the effectiveness of current prophylactic measures recommended by leading institutions. Through international data exploration, correlation can be considered to determine the necessary education and interventions needed to assist this extremely vulnerable population.

POSTER: NRS-04

Prevention of Falls in Patient Care Settings

Salma E. Taha
Faculty Mentor: Professor Regina Gonzalez-Lama
Department of Nursing

In the United States, approximately 700,000 to one million people fall in hospitals each year according to the National Database of Nursing Quality Indicators (NDNQI) (Weycer, 2019). Of those people, approximately one-third will experience an injury from these falls and about 11,000 will die (Weycer, 2019). These statistics demonstrates how significant this issue is in healthcare. However, falls are preventable in the acute care setting. Some interventions that may help reduce these numbers include fall risk assessments, mattress or chair alarms, enhanced supervision, toileting protocols, patient education, and fall prevention plan documentation. A review of the literature and statistical data will demonstrate the effectiveness of these interventions in preventing falls in the patient care setting.

POSTER: NRS-05

Analyzing the Stigma Associated with Mental Illness

Arianna F. DiBenedetto
Faculty Mentor: Professor Barbara Schiano
Department of Nursing

Individuals who suffer from a mental illness are subjected to discrimination and stigmatizing attitudes worldwide. The stigmatizing attitudes that are tied to these individuals are typically associated with the misconceptions that surround mental disorders. Through research, this project aims to analyze the stigma associated with mental illness. Specifically, it investigates the nature and form of stigma, the causes of stigma, and the effects of stigma on people with mental illness. It also provides interventions on how nurses and people in society can reduce the stigma associated with mental illness. The goal of this project is to bring a greater awareness to this ongoing issue that negatively impacts a specialized population, with the hope of reducing the negative aspects associated with mental illness.

PHYSICS AND ASTRONOMY

POSTER: PHY/AST-01

Cellular Automata, Quantum Circuits, and Chaos

Justin M. Peterkin
Faculty Mentor: Professor Sarang Gopalakrishnan
Department of Physics and Astronomy

The goal of this experiment is to study the dynamics of cellular automata. Cellular automata are discrete models composed of cells that govern their replication and destruction. These systems can model naturally occurring patterns. Cells in these systems can occupy a certain number of states (in a binary case, either 0 or 1), and predetermined rules dictate how cells transition between such states. The rules acting on individual cells depend on the configuration of their neighboring cells. Thus, local interactions between neighbors translate to global changes in the system.

This project will use code in Python, Julia, and C++ to generate multiple iterations of these evolving systems. This project will examine how factors, such as grid size, rule choice, and initial grid state tend to drive models to chaos and others to stability.

POSTER: PHY/AST-02

Comparison of E+A Galaxies in the Coma Cluster

Sam Pakravan
Faculty Mentor: Professor Charles Liu
Department of Physics and Astronomy

Studying the aging processes of galaxies helps us understand the history of the universe around us, including our own Milky Way galaxy. E+A galaxies are known for having spectra of an early-type ("E") galaxy, typically many billions of years old, and also strong hydrogen Balmer absorption lines that are produced in the photospheres of stars that are only about 1 billion years old (type "A"). That means E+A galaxies are a special type of "post-starburst" galaxies, in which star formation had been going on at a high rate but then shut down approximately 1 billion years ago. When a galaxy enters a post-starburst phase, O and B type stars (which are the brightest and most short-lived) die off, and about a billion years later leave A type stars to be the brightest in the galaxy. The goal of this project is to compare different E+A galaxies in the rich cluster of galaxies known as Coma Berenices. By comparing their spectral features, redshift, colors, and magnitudes, it will be possible to better understand how these rare galaxies evolve after their star formation has ended. By the end of this project these galaxies will help us to better understand the evolution of E+A galaxies and the evolution of the Coma cluster within the past few billion years.

PSYCHOLOGY

POSTER: PSY-01

Is Infant Sleep Related to Early Motor Milestone Onset?

Kalindi Mishra
Faculty Mentor: Professor Sarah E. Berger
Department of Psychology

Infants' sleep becomes less fragmented over the first year of life (Scher & Cohen, 2005). In the latter half of the year, researchers observed periods of interrupted sleep as mobility increased. For example, crawling and pull-to-stand promoted night wakings (Atun-Einy & Scher, 2016 Scher, 2005). Rolling allowed infants to move in their current location rather than moving from place-to-place (Kobayashi, Watanabe & Taga, 2016). Though rolling is learned before other motor skills, its effect on sleep has not been studied. Previous methods for documenting infant sleep included parent reporting and actigraphy (a wearable activity monitor). We monitored sleep using Nanit, a commercial video baby monitor. A computer vision algorithm coded the number of nighttime wake episodes (WEPs) and the maximum amount of time spent in one location (MAX) each night. We measured ten infants' sleep (mean age=4.92 mos, sd= 1.28) during the week they learned how to roll independently three nights before, the night of, and three nights after rolling onset. Interestingly, sleep was not disrupted on the night of onset. However, infants' activity level increased on the night of rolling onset, indicated by the low MAX value. Our observation differed from the increased wake episodes noticed in past studies on skills learned later on. Perhaps infants move more at night during the acquisition of rolling, but it does not contribute to the already highly disrupted sleep of young infants.

POSTER: PSY-02

How is Infant Sleep Disrupted Around Crawling Onset?

Marina N. Morkos, Michelle W. Saad
Faculty Mentor: Professor Sarah E. Berger
Department of Psychology

Motor milestone achievement during infancy has a significant impact on sleep patterns. As infants learn a new motor skill, they begin to experience an increase in night waking and movement. For example, crawlers' sleep is more fragmented (with more night waking and increased motor activity) than pre-crawlers' (Scher, 2005). The current study aims to examine the change in number of movements and wake episodes (WEPs) during infants' sleep surrounding crawling onset. We expect to find crawling-relevant movements during wake episodes as a possible sleep disruptor.

Four infants have participated thus far (mean age of crawling onset = 8.23 mos SD = 0.29 mos). This group is part of a larger study examining sleep around milestone acquisition. We utilized autovideosomnography to code specific movements during WEPs over the course of crawling acquisition (the night before, of, and after onset). Previously, non-invasive methods such as actigraphy were used to monitor body activity and sleep quality (Sadeh, 1991), but these could not document the type or location of movements.

We found no effect of time on proportion of WEPs infants spent transitioning to a hands-and-knees posture, or on WEPs. However, time spent on hands-and-knees increased on the night of crawling onset, suggesting that skill-relevant movements are practiced during sleep. Our findings indicate that fragmented sleep and postural shifts during night wakings represent a way that infants begin to consolidate new information they learned that day.

POSTER: PSY-03

Parent and Infant Sleep Changes During COVID-19

Daniel Palmieri, Martina Youssef
Faculty Mentor: Professor Sarah E. Berger
Department of Psychology

Sleep is essential across the lifespan, especially during early development (Ednick et al., 2009). Characteristics of the environment, such as neighborhood, or family size can influence sleep (Grimes et al., 2019 Johnson et al., 2018). Recently, an unexpected factor has attracted sleep and developmental researchers' attention: the COVID-19 pandemic. With shelter-in-place worldwide, lives changed. Most studies analyzing sleep-related issues during this pandemic are focused on youth, adolescents, and adults (Jiang Zhou et al.,2020). The current study investigates (a)

whether the COVID-19 sheltering in place changed caregiver and infant routine, (b) whether infant sleep schedules changed, and (c) whether parental education level influenced infant sleep schedule.

142 caregivers of infants (0-24 months) completed a 25-minute online survey from May- July 2020. Participants were recruited via snowball recruitment. Analyses showed that 59% of infants' sleep schedules changed. Predominantly, this manifested as longer naps (14.4%), different nap times (20.5%), and more settling difficulties (14.4%). We originally presumed that caregivers with higher degrees would have a better understanding of sleep behavior and development, making them more likely to keep their infants on a consistent sleep schedule. However, a chi-square analysis showed no relationship between parents' education and infant sleep change. Additional research is needed because such a worldwide pandemic can have many unanticipated, cascading developmental impacts.

POSTER: PSY-04

The Significance of Sleep In Infants

Ricaute E. Rogers
Faculty Mentor: Professor Sarah E. Berger
Department of Psychology

Sleep is a crucial factor in human life. Sleep is essential for memory consolidation and recovery, as well as for the physical development of infants. As humans sleep, we cycle through sleep states which may be identified as REM (rapid eye movement), non-REM (non-rapid eye movement), indeterminate, and the wake state. The amount of time spent in each state fluctuates to accommodate the needs of development. Several theories suggest that the amount of time infants spend in both REM and non-REM is related to learning, especially procedural learning (Fogel et al., 2015). Previous work on sleep and learning with adults can not be applied to infants. For infants, motor skill acquisition, such as learning to sit, is an appropriate context for studying the role of sleep states in infant learning. For this study, a commercial baby monitor, Nanit, was used to record infants' full nights of sleep. Recordings captured the infants' night of sleep the day before, the day of, and the day after motor milestone acquisition. A series of Bayesian repeated-measures ANOVAS will test for mean differences in the amount of time spent in each state on the nights before, of, and after the onset of sitting with hands. The role of sleep states for infant learning will be discussed.

POSTER: PSY-05

How Does Co-sleeping Affect Infant Sleep?

Rehab Sobhi
Faculty Mentor: Professor Sarah E. Berger
Department of Psychology

Infants experience sleep states (REM and nonREM) during the course of the night. Little is known about how different sleep states contribute to learning and developmental outcomes. To further elucidate the change of infant sleep as motor milestones arise, a research study was conducted that monitored infants' sleep onset, wake time, nightly wake episodes, sleep duration, and sleep efficiency. Aside from milestone achievement, I wanted to examine whether factors such as parental attachment disrupted sleeping patterns. Before crawling, infants wore an actigraph around their left ankle until they were able to walk independently. Moreover, a Nanit Home Baby Monitor recorded activity during the night, and daily parent dairies were used to keep track of any skills that develop over time and any nightly wake periods. Collected data from three nights per month, videos before, on, and after milestone acquisition were coded for REM and nonREM intervals.

Of the nine participants, five infants slept in their own room, one shared a room with an older sibling, and three slept in a crib in their parent's room. To develop a better understanding, we compared two infants longitudinally. Data were visualized graphically to explore developmental patterns. Infants who slept with their parents had increased parental interventions resulting in more disruptive sleep. Despite parental influence, both infants experienced several wake episodes throughout their sleep due to milestone acquisition. Some limitations include not having enough data to compare a larger sample size.

POSTER: PSY-06

Educating College Students about Digital Footprints and Internet Algorithms

Ariana A. Hernandez
Faculty Mentors: Professor Patricia J. Brooks, Jessica Brodsky
Department of Psychology

Despite being active Internet users, students may lack awareness that they are leaving a digital footprint (Martin et al., 2020) and how sharing information online may put their privacy and futures at risk (O'Keeffe et al., 2011). Students also lack awareness of how algorithms personalize search results and create filter bubbles (Brodsky et al., 2020). In our study, college students (N = 326) completed one of two online interventions aimed at enhancing knowledge of (1) how online behavior leaves a digital footprint and the Big 5 companies profit from this data or (2) how algorithms influence search results. Each intervention used an animated video paired with slides to illustrate concepts.

At pre/posttest, students answered multiple-choice questions about online information sharing and storage, companies controlling the Internet, and algorithmic filtering. At posttest, students also answered open-response questions asking why parents should be concerned about children's digital footprints and how the Internet contributes to political polarization.

Students knew 1.6 of the Big 5 companies at pretest. The Digital Footprints condition made gains at posttest, averaging 3.1 out of 5 companies. Students were more accurate on digital footprints questions than algorithm questions. The Digital Footprints condition made gains on multiple-choice questions about footprints; neither condition made gains on algorithm questions.

On the open-ended question about parental concerns, both conditions expressed concerns that online information is never deleted. Students in the Digital Footprints condition were more likely to be concerned about information being saved or shared by others, while students in the Algorithms condition more often mentioned algorithm-related risks. On the open-ended question about political polarization, students in the Algorithm condition were more likely to express awareness that online information is personalized based on user data and mention technical mechanisms that facilitate personalization.

Overall, given college students' ubiquitous Internet use, our findings suggest that students benefit from direct instruction to foster their understanding of digital footprints and algorithm literacy (Cohen, 2018).

POSTER: PSY-07

The Effects of Mortality Salience on Support for President Donald Trump and Presidential Candidate Joe Biden

Denis Eder, Kailey Volpetti, Hanna Youstina, Karen Youssef, Caroline Saad, Samantha McGrath, Jessica Grande
Faculty Mentor: Professor Florette Cohen
Department of Psychology

Support for presidential candidate Donald Trump increased in the aftermath of several terrorist attacks in 2015 (Cohen, Solomon, & Kaplin, 2017) similar to Americans' greater enthusiasm for President George W. Bush after the September 11, 2001 terrorist attacks on the Pentagon and World Trade Center. According to terror management theory (Greenberg, Pyszczynski, & Solomon, 1986 Solomon, Greenberg, & Pyszczynski, 1991), people are prone to embrace charismatic politicians in times of historical upheaval to mitigate existential terror. Consistent with this view, previous research has demonstrated that reminders of death (relative to an aversive control condition) increased support for a charismatic leader in a hypothetical gubernatorial election, support for President Bush and his policies in Iraq prior to the 2004 presidential election and support for Donald trump and his anti-Immigration policies in 2016. The present study (conducted fully on-line) hypothesized and found that a death reminder significantly increased support for President Donald Trump and reduced support for Presidential candidate, Joe Biden ($p<.01$). These findings suggest that electoral outcomes and public policy can be affected when existential concerns are aroused.

POSTER: PSY-08

How Does Awareness of Cognitive Difficulties and Worthlessness Feelings Relate to Depression Severity Among Youth?

Victoria Mollo
Faculty Mentor: Professor Ellen-ge Denton
Department of Psychology

Many people experience cognitive difficulties and feelings of worthlessness, but what aspects of these symptoms are indicative of depression pathology? The Beck Depression Inventory (BDI) and Center for Epidemiological Studies Depression (CESD) are two depression measures used to self-report feelings of worthlessness and cognitive symptoms as a component of youth depression. Using Item Response Theory: item discrimination and difficulty parameters, I aim to identify which cognitive and worthlessness symptoms on the BDI and CESD are indicative of atypical depressive symptoms among 50 Guyanese youth. Among 207 Hong Kong outpatients, the BDI and CESD items measured normal to severe depression symptoms with θ values of approximately -1 and 2.3, and 1.5 to 2.0, respectively. Feelings of worthlessness, past failure, on the BDI had the highest discrimination (2.17 to 2.33) relative to other depressive symptoms for 560 Brazilian students. Similarly, past failure assessment was highly weighted and related to atypical depressive symptoms, in a sample of 351 Puerto Rican students. In addition, cognitive problems of indecision or "negative thoughts" was also highly weighted. To determine symptoms most indicative of depression severity, I will analyze item discrimination and difficulty parameter estimates. I expect that feelings of worthlessness will have item discrimination estimates > 2.20 and concentration problems > 1.40. I hypothesize that concentration disturbance and feelings of worthlessness will assess the most severe depression symptoms (item difficulty parameter) at θ values > 0. Consistent with the literature, our past failure items were most informative at severe levels of depression. Both concentration disturbance and worthlessness items were more informative of moderate to severe (atypical) symptoms of depression at θ values > 0.8: BDI 13 (indecisiveness), CESD 5 (pay attention), BDI 3 (past failure), BDI 8 (self-criticalness), BDI 14 (worthlessness), CESD 4 (good as other kids), and CESD 19 (past failure). In fact, youth had a > 30% probability of endorsing 5 out of 9 worthlessness items. We conclude that youth awareness and report of concentration problems and worthless feelings are key to understanding their depression risk.

POSTER: PSY-09

The Anxiety and Fears of Going to the Dentist

Silvy Mansor
Faculty Mentor: Professor Valkiria Durán-Narucki
Department of Psychology

One of the most important elements of physical wellness is taking care of one's teeth. Many people in this world do not understand the importance of their teeth and do not take appropriate steps towards their oral hygiene, which includes dentist visits and proper dental care. However, many people are afraid of going to the dentist. Whether it is from being afraid of the pain or possible diagnosis. Based on existing research, I found that anxious patients often form inaccurate expectations of pain and discomfort before they receive treatment. Those on the lower economical scale tend to be unable to seek care as frequently, often resulting in higher decay rates, diminished opportunities to receive restorative procedures, failure to learn the positive aspects of treatment, and greater numbers of tooth extractions. Therefore, they have greater fear-related experiences, and higher levels of avoidance, than those in the higher socioeconomic scale. It was also found that developing trust between the practitioner and the patient helps ease the fear and anxiety. Good communication is the key to be able to facilitate a change in a patient's behavior. This research is important for both patients and dentists. It can be helpful for the patients, so they are able to find the right dentist for their needs since not all dentists are great with communication. This is also important for dental practitioners to establish good communications with their patients to ease their anxieties for better oral hygiene.

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POSTER: PSY-10

Beliefs about the Causes of Autism in Kenya: Comparing Community Conceptions to Personal Beliefs

Lily Chen, Catherine Messina
Faculty Mentor: Professor Kristen Gillespie-Lynch
Department of Psychology

Background: Autism resources remain particularly scarce in Kenya (Riccio, 2011). In one of the few studies about autism in Kenya, parents and educators reported experiencing stigma and challenges when accessing care (Gona et al., 2015). They expressed misconceptions about autism. Gona's research did not distinguish between what the participants personally believed and what they had been told by others in the community.

Aim: To examine if people in Kenya describe the etiology of autism similarly or differently from what they have been told by community members.

Methods: In collaboration with the Kenya Autism Alliance and autistic university students, we adapted an autism training. We delivered two half-day long trainings in Nairobi and Mombasa; 74 people completed surveys. Nine open-ended questions assessed access to care, personal, and community conceptions of autism. We coded responses to: "What have you been told causes autism by others?" and "Please share what you yourself think causes autism?"

Results: Most participants indicated biomedical causes (40.7% e.g., genetics), followed by issues with parents (35.8%), environmental toxins (28.4% e.g.,vaccines), and preternatural forces (27.2% e.g., witchcraft). Chi square tests revealed that participants were more likely to attribute autism to biomedical causes and less likely to endorse preternatural causes (ps < .001). However, they did not differ from community members in attributing autism to parents or vaccines (ps > .60). Parents (26%) were more likely to attribute autism to vaccines than teachers were (4% p = .04). Teachers (33%) were more likely to attribute autism to parents than parents (4% p = .02).

Conclusions: Participants in Kenya received a mix of accurate information and misinformation about autism from community members. They successfully rejected some inaccurate causes (e.g., witchcraft) while accepting others (e.g., vaccines, mother's decisions). To better understand perspectives on autism in different cultures, it is important to distinguish between what people have been told by community members and what they themselves believe.

POSTER: PSY-11

Using a Participatory Autism and Universal Design Training for Faculty to Improve the Educational Success of Diverse Students

Kyle Gravitch, Deondre Williams, Alesya Guastella
Faculty Mentor: Professor Kristen Gillespie-Lynch
Department of Psychology

In school settings, educators struggle to either adjust or enhance their learning environments to incorporate all students, especially those with autism spectrum disorder (ASD). Insufficient training to help faculty reach all their students leads to lack of understanding and support in academic environments. Autistic students two years after graduating high school are less likely than students with most other disabilities to enter higher education or obtain employment (Shattuck et al., 2012). A more inclusive way of educating students on the spectrum is a great necessity. Understanding challenges students face as well as fostering a more inclusive environment will help improve graduation rates. This study intends to investigate faculty understanding of ASD by drawing from data derived from a training program developed by a research team consisting of seven autistic and seven non-autistic students and academics. Researchers surveyed 90 faculty members on their understanding and attitudes toward autism and Universal Design (UD). We will code faculty responses to identify improvements that faculty can use to adjust to all students' learning and sensory needs. Initial results indicated that 35% of faculty had engaged in UD training in the past. Participation in our training was associated with improved autism knowledge and stigma (ps<.001).We will qualitatively code questions such as "What strategies do you plan to use to effectively teach and support your autistic students?" collected at pre-test, post-test, and maintenance. Findings will inform UD-aligned strategies to improve professor-student-relations with diverse students and specifically autistic students.

POSTER: PSY-12

Comparing Narrative Writing of Autistic and Nonautistic College Students

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Department of Psychology

Introduction. Despite its importance to understanding autism, autistics' writing remains understudied. Written language contains far less paralinguistic and nonverbal information, which can be difficult for autistic individuals to process (APA, 2013 Lavi & Mainess, 2019), yet involves taking the perspective of the reader. Baron-Cohen et al. (1985) argued that deficits in perspective-taking ability (ToM) underlie autism however, recent research suggests that sensorimotor differences may better explain autistic differences and contribute to a range of challenges and strengths (Kapp, 2013 Hennant et al., 2016). For one, autistic people tend to be more detail-oriented than nonautistic people (Mottron et al., 2003). Autistic children's spoken narratives seem to show reduced ToM (Losh & Capps, 2003), but their ToM improves with age (Happé, 1995). Researchers have reported conflicting findings regarding whether autistic adults' writing differs (Brown & Klein, 2011) or does not differ (Brown et al., 2014 Gillespie-Lynch et al., 2020) from nonautistic adults' writing in terms of ToM, as well as whether nonautistic (Brown & Klein, 2011 Brown et al., 2014) or autistic (Gillespie-Lynch et al., 2020) adults produce higher quality writing.

Objectives. To conduct an in-depth analysis of the writing of autistic and nonautistic university students and to see whether autistic students' often detail-oriented cognitive style is associated with specific strengths.

Methods. Autistic and nonautistic students (N = 46) responded to a prompt asking them to "write a very short story." The stories were typed into a word processor.

Preliminary Results. Autistic and nonautistic students' writing was more similar than different. Multiple measures suggested that autistic students had a more expansive vocabulary (ps < .05); they also reported enjoying writing more than nonautistic students ($p < .001$). Enjoying writing was associated with writing longer and highly creative pieces (ps < .04).

Conclusions. The general absence of group differences suggests that autistic individuals produce writing that is similar to the writing of nonautistic individuals in the absence of graphomotor barriers. Further, creative writing may be a useful tool for teaching students to enjoy writing.

POSTER: PSY-13

Examining the Motivations and Career Goals of Autistic High School Students within an Informal Technology Program

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The transition from high school to college is a difficult period in one's life. In this study, we are analyzing the motivations and future goals of high school students who have autism. We are examining interviews conducted with autistic teenagers at a summer technology program. The data is in a question-answer format and separated into different sections. This study's focus is on a section of the interview entitled, "Plans for the Future". We will qualitatively code responses to five questions: 1."What are your job and/or school-related goals for right after high school?" 2. "What job or type of job would you like to have in the future? Why do you want this job?" 3. "How are you preparing now to get this job?" 4. "What are your job and/or school-related goals for five years after high school?" 5. "How do you plan to go about finding a job? Follow up: What are some steps you plan to take to find a job?" Preliminary themes drawn from reading through the data indicate that students' primary motivations for pursuing goals beyond high school are often based on societal and/or familial pressure or expectations. This study will provide valuable information to better help us assist Autistic high school students. By understanding the goals and motivations of autistic students, we can begin to guide students with autism toward their future goals.

POSTER: PSY-14

A Study of Virtual Reality Used as a Treatment for Specific Phobias and Agoraphobia

Michael Reynolds
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People have always had to deal with their phobias in one way or another. Historically, there have been many types of treatments used to help patients overcome these phobias, including medication, cognitive behavioral therapy, and exposure therapy. Exposure therapy is the most common and involves patients becoming directly exposed to their phobia. An alternative version of exposure therapy is virtual reality therapy. Mental Health sepcialists have begun using virtual reality exposure therapy to treat both specific phobias and agoraphobia. Researchers have looked into the effects of virtual reality exposure therapy and how effective it is as a treatment. Multiple studies found it to be both an appealing and effective way to treat phobias. Some of these studies also suggest that it can be used in combination with traditional methods to be more successful.

POSTER: PSY-15

The Myriad of Factors that Affect a Woman's Sexual Self-Schema

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Intersectionality is the consideration of many social variables and their combined impact. This study examined how women's thoughts about their sexual self are influenced by race, religion, and sexuality. Using Hill (2007)'s Sexual Self-Schema Scale (SSSS) in an online survey, we tested a diverse sample of women hypothesizing their sexual self-schemas were influenced by race, religion, and sexuality, specifically, that queer women, women of color, and women of conservative religions will have a more negative sexual self-schema, but there will be interaction effects. In this survey, Christian women, compared to all other non-Christian women, described their sexual self as more direct and outspoken and also loving and warm, but no differences were observed on the negative sexual self schema dimension of embarrassed and reserved. An interesting and significant interaction effect found a combined effect of race and sexuality: non-White non-heterosexual women reported lower embarrassed and reserved sexual selves while non-White heterosexual women were most likely to describe their sexual self as embarrassed and reserved. Thus, women of different and diverse perceptions form contrasting sexual self-schemas consistent with the theory of intersectionality

POSTER: PSY-16

Breaking Down Bias: An Empirical Study On Transgender Prejudice

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Department of Psychology

This online experiment tests hiring prejudice for a restaurant host position in a mock job application based on the applicant's sex, gender, and sexuality. It is hypothesized that one's attitudes of heterosexism, genderism, and transphobia influence their hiring decisions. Therefore, higher scores on the Gender Attitude Inventory will be positively correlated with hiring preference for the cisgender, straight, female applicant; higher scores on the Homophobia Scale will be positively correlated with hiring preference for the straight applicant; and higher scores on Genderism and Transphobia Scale will be positively correlated with hiring preference for the cisgender applicant. Three hundred seventy-six undergraduate PSY 100 students at the College of Staten Island judged one of eight applicants who varied by sex, gender, and sexuality. The students then rated the probability of hiring the applicant. Participants also completed scales that assessed homophobia, genderism and transphobia, and gender attitudes. Participants that scored high on homophobia displayed a preference for the female straight transgender applicant; participants that scored high on genderism and transphobia were most likely to hire the male gay cisgender applicant; and participants that scored high on traditional gender attitudes were most likely to hire the female cisgender straight candidate. This shows that these factors may combine in real world hiring decisions.

POSTER: PSY-17

John William Money: Deviant or Misunderstood Researcher

Annet C. Sokol
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This study evaluates the life and contributions of Dr. John William Money, a controversial pioneer in the field of gender and sexuality. This analysis evaluates his significance in the field of psychology in an historical context. Archival materials including biographies, obituaries, and critiques were sampled and analyzed for important contributions and life events in order to assess whether Money was a deviant, as accused by some, or a true pioneer. Although controversial, and not without criticism, without his work it is possible that the psychological community would not fully recognize transsexuality and varying approaches to intersexuality for some time.

POSTER: PSY-18

Circadian Rhythms of African Naked Mole-Rats

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African naked mole-rats maintain large underground colonies in East Africa and require the cooperative behavior of colony members to find food, build and protect the nest, and help care for the young. Previous studies that have examined the daily rhythms of naked mole-rats in captivity have failed to find a clear colony pattern, with animals active at all hours of the day. Our study used radio identification (RFID) based tracking of the movement of animals in two colonies across four sets of 60-hour periods and recorded the periodicity of each animal. We will now be determining the role of individual colony members, the colony queen in particular, in relation to the colony as a whole. Our hypothesis is that the queen will play a crucial role in predicting the daily circadian rhythm of the colony.

POSTER: PSY-19

The Naked Mole-Rat: A New Model for Psychiatric Research

Kelly Brennan
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Department of Psychology

Schizophrenia is a debilitating psychiatric disorder that affects approximately 20 million adults. Yet, there is a lack of an appropriate animal model that displays schizophrenic-type behaviors in research. African naked mole-rats (heterocephalus glaber) follow a eusocial hierarchy, a caste system which requires high levels of prosocial behavior to work due to them constantly working together. Colonies live in tunnels underground where the oxygen levels can be very low, and most of their time is spent piled in a nesting chamber where the levels of carbon dioxide can become very high. Humans are known to be social creatures and although we do not live in a eusocial society, we do rely on others and engage in some prosocial behaviors. Psychiatric disorders, such as schizophrenia, alters cognition and is also associated with a deviation from the societal norm. A gene named KCC2 is found naturally mutated in naked mole-rats with a mutation that mimics some humans with schizophrenia. Previously we found that colony nest carbon dioxide can mask the negative effects of KCC2 mutation, which could indicate staying away from the colony could turn on the gene. The present study examined if NMR who are not spending much time in the nesting chamber, which is their societal norm, may display schizophrenic-type behaviors. Three different areas of schizophrenic-type behaviors will be measured through observations and behavioral tasks: stereotypical behavior; memory; and antisocial behavior. Results for the behavioral tasks looking at antisocial behavior showed a significant correlation between one of the foraging tasks and time spent in the nesting chamber. Additional analysis of memory and stereotypical behavior will be conducted to determine whether naked mole-rats that avoid the colony nest may be useful to study schizophrenia.

POSTER: PSY-20

3-Dimensional Reconstruction of Cleared Tissue in the African Naked Mole-Rat

Amaney Hassan
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Department of Psychology

The African naked mole-rat is a useful animal model to study brain development disorders which may have altered brain organization in response to environmental conditions. We have developed a process for whole-brain imaging in naked mole-rat tissue and have assembled a light sheet microscope to image and reconstruct the entire brain. This project will develop a process to take the images from the 360 degree view of the naked mole-rat brain and reformat them so that they can be read into Imaris software for complete reconstruction of the brain. This work will allow us to see how neurons and blood vessels develop in naked mole-rats raised under different environmental conditions, and can be used for other organs of interest, such as the pancreas.

POSTER: PSY-21

Different Types of Bilingualism and Working Memory Capacity

Victoria F. Nicoletta
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Department of Psychology

Evidence has suggested that there is a difference in the cognitive functioning of monolinguals and bilinguals, especially with respect to working memory. Previous research has found that bilinguals as a homogenous group are more successful in specific types of memory tasks than their monolingual counterparts, but less successful in others. The purpose of this study is to further investigate the differences in working memory between these groups by dividing the bilingual group into Heritage Bilinguals — those who learn their home (heritage) language and the societal language, English, simultaneously, but have a stronger grasp of the English language — and Second Language Learners who learned English as their second language. 44 Participants in this study from the College of Staten Island's Psychology students were categorized into one of these three groups (23 Monolinguals, 15 Heritage Bilinguals, 6 Second Language Learners). They completed the reading and working memory capacity task (Daneman & Carpenter, 1980) that required them to read groupings of 2 to 5 English sentences and then respond with the last word of each sentence in the order that they appeared. Results indicated a higher success rate in Bilinguals than Monolinguals. Heritage Bilinguals answered with an average of 84.3% accuracy, Second Language Learners answered with an average of 86.7% accuracy, and Monolinguals answered with an average of 79.7% accuracy.

POSTER: PSY-22

Attention Shifting from Social and Non-Social Images as a Predictor of Autistic Traits in Infancy

Keren Isufi
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Department of Psychology

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by social-communicative difficulties, and it can be reliably diagnosed at 24 months old. During childhood, individuals with ASD exhibit differences in the adaptive allocation of visual attention, and this is thought to contribute to impairments in encoding and evaluating social cues (e.g., Teh et al., 2018), which could have long-term effects on social interaction and social perception (Lai et al., 2014).

Infants with an older sibling diagnosed with ASD are at a higher likelihood of developing ASD (HLA), and prospective studies with HLA have found attentional differences to be an early predictor of ASD (e.g., Zwaigenbaum et al., 2005). For example, HLA infants later diagnosed with ASD were slower to shift their attention between two images than low likelihood for autism (LLA) infants (Elsabbagh et al., 2013). The current study extends past work to look at attention-shifting behaviors in HLA and LLA infants and asks whether these attentional patterns during the first year of life relate to autistic traits at the same age.

This study utilized eye-tracking technology to examine attention shifting in 6- to 12-month-old LLA and HLA. Each trial began with infants seeing one of 30 centrally-presented images (trials included 10 happy faces, 10 fearful faces, and 10 objects) for 1000 ms. The central image remained visible while a peripheral distractor (checkerboard pattern) appeared on the screen's left or right side for 2500 ms. Infants were later assessed for early ASD-related traits with the Autism Observation Scale for Infants (Bryson et al., 2008). For each trial in the eye-tracking task, latency to shift attention from the central image to the peripheral stimulus will be calculated. Based on past work, we expect HLA and LLA to both show slower shifting from fearful faces as compared to happy faces (Wagner et al., 2020), but for objects, HLA are expected to be slower to shift as compared to LLA (Elsabbagh et al., 2013). We also hypothesize that slower shifting from objects will predict higher levels of autistic traits at the same age. This work will further our understanding of how differences in attention shifting and emotion processing might be early indicators of autistic traits.

POSTER: PSY-23

Characterization of Dopamine Neuron Glutamate Release Sites in Striatal Gray and White Matter Regions

Clare L. Mitchell
Faculty Mentor: Professor Leora Yetnikoff
Department of Psychology

Midbrain dopamine neurons play vital roles in reward, motivation, and learning. The axons of these neurons project throughout the forebrain, with their most prominent target being the striatum. Within the striatum, dopamine neurons are known to synapse mainly onto medium spiny projection neurons, cholinergic interneurons, and fast-spiking interneurons. Until recently, dopamine-related behavioral dysfunctions and neuropsychiatric disorders were related primarily to altered synaptic connectivity between dopamine terminals and these varying striatal cell types. However, recent evidence has shown that dopamine-related neuropsychiatric disorders are also associated with myelin dysregulation, the mechanisms of which are unknown. Is it possible that dopamine neuron function contributes to myelin regulation? Dopamine neurons co-transmit glutamate, a neurotransmitter known to guide populations of myelinating oligodendrocytes to their appropriate positions on the axon, drive their maturation, and regulate axon myelination. In support of the notion that dopamine-glutamate co-transmission may contribute to myelin regulation, our lab has identified dopamine neuron glutamate release sites within striatal fiber bundles, including the anterior commissure. The goal of this project was to characterize these white matter release sites by comparing them qualitatively and quantitatively to release sites within striatal gray matter. Striatal dopamine neuron glutamate release sites were identified in coronal sections of male and female DAT-IRES-creAi32/Ai32 mice using the proximity ligation assay, where proximity (< 20nm) between plasmalemma ChR2-EYFP and vesicular VGLUT2 indicates putative sites of glutamate release from dopamine neurons. We found that puncta representing dopamine neuron glutamate release sites were smaller but occurred at a higher density in the white matter compared to the gray matter. These results provide important insight into the nature of dopamine neuron glutamate release sites in striatal white matter. Understanding how these release sites may potentially impact myelin regulation will make important contributions to our understanding of dopamine-related behavioral dysfunction and neuropsychiatric disorders.

POSTER: PSY-24

How Does Religion, Income, and Duration of a Relationship Effect Romantic Relationships

Nicholas P. Morreale
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Department of Psychology

Relational satisfaction is an important aspect to a successful relationship and can negatively or positively affect such a relationship.

This study will examine how religion, economic income, and duration of romantic relationships can impact relational satisfaction scores. We utilized the Couples Satisfaction Index (CSI) to measure the relational satisfaction scores for the study. To find the relational satisfaction scores of our participants, we conducted an online survey of 211 participants ages 18 and older. In the study, we had to exclude nine participants' surveys due to inaccurate

answers, which lead to our final sample size of 202 participants.

One limitation of our study was that we only had limited time to collect our data. For future research, having a longer period of time to collect data will help get more accurate data.

We were unable to identify any significant differences in economic income and duration of romantic relationships on relational scores. However, we found a significant difference between religion and relational scores, a positive difference, in which couples that shared religions had better relational scores compared to income and duration.

While there is a significant difference between religion and relational scores, more research will need to be done on specific religions along with having a wider range of religions, to make the study more culturally suitable to get more accurate results.

SOCIOLOGY AND ANTHROPOLOGY

POSTER: SOC/ANT-01

South African Migration Drivers

Gregory T. Fazio
Faculty Mentor: Professor Jean Halley
Department of Sociology and Anthropology

South Africa has long been a destination for migrants from Africa, Europe, and Asia. Post-apartheid South Africa seemed to be the premier destination for migrants in Africa, because it appeared institutionalized racism was declining and there would be more opportunities for migrants to find employment. During the early 1990's South African immigration policies were lenient, making it an easy place for migrants to find shelter and seek employment. During the post-apartheid era there has been an increase in migration trends, especially from across the African continent. Migrants experiencing poverty, famine, inflation and unemployment are in many ways forced to leave their country of origin in order to survive. Migrants from the Democratic Republic of Congo have emigrated to South Africa after experiencing deadly civil wars that demolished the infrastructure of the nation. Malawian migrants have fled Malawi after experiencing malnutrition due to famine. Civil war in Angola has left its inhabitants vulnerable to political persecution and has driven many migrants out of the country and into South Africa. Zimbabwe has been in an economic downturn due to hyperinflation, which has crippled its economy. Hyperinflation in Zimbabwe has driven many citizens into South Africa. Johannesburg, South Africa has become the premier destination for migrants, where they hope to find refuge and employment, to support themselves, and also send remittances back to their family in their country of origin. In this project I will review scholarly articles related to migration patterns driving migrants in and out of Johannesburg, South Africa. I will examine the primary migration drivers leading people to leave Angola, the Democratic Republic of Congo, Malawi, Mozambique, Nigeria, the Republic of Congo, Zimbabwe, and Zambia, focusing on ways in which some factors are similar across each of these countries and cases in which they are specific to each country. I will also examine the pull factors that drive migrants to leave South Africa and migrate back to their country of origin.

POSTER: SOC/ANT-02

Migrant Access to Healthcare and Education in South Africa

Angelica Lisiewski
Faculty Mentor: Professor Jean Halley
Department of Sociology and Anthropology

South Africa has one of the largest populations of cross border migrants in the world. In recent years people are moving to South Africa out of choice, or often due to the extreme circumstances that makes it imperative for them to move. They are searching for safety, better jobs, education for themselves or their children, healthcare, and the chance to send money to their families back home. Though the South African government has attempted to limit the number of immigrants, the population living in the country continues to grow. This literature review will explore migrant access to and the quality of healthcare and education in South Africa. The data collected will come largely from peer-reviewed journals and will be supplemented with interviews of social workers who provide service to migrants. My preliminary findings show that some migrants are denied access to healthcare despite legislation mandating access as a right. The study has also found that the xenophobic attitudes of healthcare workers, along with language barriers, may play a role in reducing access. Findings also suggest migrant children are significantly disadvantaged and overburdened due to a poorly functioning asylum system.

POSTER: SOC/ANT-03

Understanding Atheism and Its Stereotypes in the United States

Justin Garlisi
Faculty Mentor: Professor Kristen Addessi
Department of Sociology and Anthropology

From the early 2000s onward in the United States, widespread anti-atheist sentiment expressed by many Americans has contributed to misunderstandings about what being an atheist is. Sociological studies have documented such misunderstandings, such as assumptions that all atheists are angry, troubling, untrustworthy, or immoral; this causes many Americans to view atheists unfavorably. This is a considerable problem because these prejudiced beliefs may promote hostility between atheists and non-atheists. Moreover, numerous atheists have reported feeling misunderstood, isolated and stigmatized as a result of anti-atheist discrimination. This research project uses academic studies and surveys to establish that there is not only widespread anti-atheist sentiment in the United States, but that this sentiment affects atheists negatively. Using these sources, I set out to explain what sort of prejudiced beliefs surround atheism, and how atheists respond to this prejudice. In surveys and interviews, atheists have responded to such discrimination differently. Some become discouraged, concealing their identity; others have completely abandoned the religious community they were once part of; some turn to activism in an effort to combat anti-atheist sentiment.

WORLD LANGUAGES AND LITERATURES

POSTER: WL&L-01

Deaf People Accessibility Healthcare

Jacquelyn M. Mahoney
Faculty Mentor: Professor Russell Rosen
Department of World Languages and Literatures

This study provides an overview of health services and individuals who are Deaf. It addresses issues of poor communication and interaction between medical personnel and Deaf patients. There is an inadequate number and use of medical sign language interpreters in hospitals and doctors' offices. As a result, medical personnel rely on other forms of communication to interact with their Deaf patients, including lip reading and written communication. The information between doctors and patients are often miscommunicated. This project offers strategies for creating communication bridges between Deaf patients and hearing doctors.

Poster Presentations - Student Scholars

STUDENT	FACULTY MENTOR	DEPARTMENT	PRESENTATION ID
Mehnoor Aamer	Alfred Levine	Engineering and Environmental Science	EES-08
Abir Abou Znak	Xin Jiang	Engineering and Environmental Science	EES-04
Aleena Abraham	Margaret Berci	Curriculum and Instruction	C&I-01
Angelyne Acevedo	Joseph Petrucelli	Accounting and Finance	ACC/FNC-03
Nicole C. Agu	Patricia Galletta	Accounting and Finance	ACC/FNC-02
Anes Ahmed	Lee Papa	English	ENG-01
Nana Dufie Akowuah	Michelle Esposito	Biology	BIO-04
Martin J. Alava	Xin Jiang	Engineering and Environmental Science	EES-02
Susan M. Albarano	Kelly Conover	Educational Studies	EDU-01
Aseel Alsahori	Michelle Esposito	Biology	BIO-05
Watuthanthirige R. Alwis	Joseph Petrucelli	Accounting and Finance	ACC/FNC-05
Theresa Antony	Kristen Gillespie-Lynch	Psychology	PSY-13
Emylia Benavente	Tara Mateik	Media Culture	MC-05
Adam Blyth	Emma Johnson	Media Culture	MC-02
Kelly Brennan	Dan McCloskey	Psychology	PSY-19
Jasper Caballero	Deborah Sturm	Computer Science	CSC-03
Danielle R. Cabanas	Lara Saguisag	English	ENG-02
Hector Campo	Tara Mateik	Media Culture	MC-06
Kaitlyn Casserly	Mark Lewis	History	HST-01
Tony Chan	Xin Jiang	Engineering and Environmental Science	EES-03
Jacob Chen	Xiaowen Zhang	Computer Science	CSC-05
Lily Chen	Kristen Gillespie-Lynch	Psychology	PSY-10
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William Cole	Xin Jiang	Engineering and Environmental Science	EES-02
Lara A. Colombo	Nancy Liu-Sullivan	Biology	BIO-08
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Karen Correa	Jason Bishop	English/Linguistics	ENG/LING-01
Gabriella Cosenza	Darryl B. Hill	Psychology	PSY-15
Alyssa Costantino	Nancy Liu-Sullivan	Biology	BIO-09
Angelina D'Aquino	Michael DeConzo	Educational Studies	EDU-02
Kylie M. Dalessandro	Darryl B. Hill	Psychology	PSY-16
Krissy Dellecave	Jason Bishop	English/Linguistics	ENG/LING-02
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Alexandra V. Diaz	Jason Bishop	English/Linguistics	ENG/LING-02
Arianna F. DiBenedetto	Barbara Schiano	Nursing	NRS-05
Safia H. Djemil	Alfred Levine	Engineering and Environmental Science	EES-10
Stephanie Donkor	Isabel Rechberg	Management	MGT-03
Alan Eappen	Deborah Sturm	Computer Science	CSC-04

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Gianna Elci	Jimmie Fata	Biology	BIO-06
Mohamed Elkoptan	Alfred Levine	Engineering and Environmental Science	EES-10
Andrew N. Farmer	Isabel Rechberg	Management	MGT-04
Gregory T. Fazio	Jean Halley	Sociology and Anthropology	SOC/ANT-01
Dilmi I. Fernando	Joseph Petrucelli	Accounting and Finance	ACC/FNC-04
Daniel Ferraro	Xin Jiang	Engineering and Environmental Science	EES-06
Sara Filip	Regina Gonzalez-Lama	Nursing	NRS-01
	Regina Gonzalez-Lama	Nursing	NRS-02
Victoria Fischer	Mathew Gargano	Computer Science	CSC-02
Mary Fowokan	Regina Gonzalez-Lama	Nursing	NRS-02
Nathaniel Furhang	Xin Jiang	Engineering and Environmental Science	EES-02
Justin Garlisi	Kristen Addessi	Sociology and Anthropology	SOC/ANT-03
Corina Gerbino	Nancy Guo	Marketing	MKT-02
Tara Gerbino	Regina Gonzalez-Lama	Nursing	NRS-02
Reem Gouda	Abdeslem El Idrissi	Biology	BIO-03
Jessica Grande	Florette Cohen	Psychology	PSY-07
Kyle Gravitch	Kristen Gillespie-Lynch	Psychology	PSY-11
Alesya Guastella	Kristen Gillespie-Lynch	Psychology	PSY-11
Amaney Hassan	Dan McCloskey	Psychology	PSY-20
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Flopatir Heness	Alfred Levine	Engineering and Environmental Science	EES-13
Ariana A. Hernandez	Patricia J. Brooks,	Psychology	PSY-06
	Jessica Brodsky	Psychology	
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Keren Isufi	Jennifer Wagner	Psychology	PSY-22
Kevin Jeong	Alfred Levine	Engineering and Environmental Science	EES-09
Safraz Juman	Alfred Levine	Engineering and Environmental Science	EES-11
Mark Khalfin	Xin Jiang	Engineering and Environmental Science	EES-05
Mehnoor Khan	Alan Lyons,	Chemistry	CHM-02
	QianFeng Xu	Chemistry	
Fjolla Kida	Benjamin Silliman	Accounting and Finance	ACC/FNC-06
Ilia Krisulas	Reece Peck	Media Culture	MC-04
Skyler Labetti	Alan Zimmerman	Marketing	MKT-03
Mario Laniado	Alejandra Alonso	Biology	BIO-01
Angelica Lisiewski	Jean Halley	Sociology and Anthropology	SOC/ANT-02
Ashraqat Mahmoud	Dan McCloskey	Psychology	PSY-18
Jacquelyn M. Mahoney	Russell Rosen	World Languages and Literatures	WL&L-01

Poster Presentations - Student Scholars

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Anastasia Maximenko	Alan Lyons	Chemistry	CHM-01
Samantha McGrath	Florette Cohen	Psychology	PSY-07
Catherine Messina	Kristen Gillespie-Lynch	Psychology	PSY-10
Jan Markus Milan	Deborah Sturm	Computer Science	CSC-03
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Clare L. Mitchell	Leora Yetnikoff	Psychology	PSY-23
Victoria Mollo	Ellen-ge Denton	Psychology	PSY-08
Marina N. Morkos	Sarah E. Berger	Psychology	PSY-02
Nicholas P. Morreale	Reza Ziai	Psychology	PSY-24
Ariana Moy	Regina Gonzalez-Lama	Nursing	NRS-02
Yilam Ng Cen	Jimmie Fata	Biology	BIO-07
Victoria F. Nicoletta	Irina A. Sekerina	Psychology	PSY-21
Konstantin Novichenko	Sos Agaian	Computer Science	CSC-01
Alkhansa Nusrallah	Xin Jiang	Engineering and Environmental Science	EES-04
Danielle Ohana	Alan Lyons	Chemistry	CHM-03
Ahmed Osman	Alfred Levine	Engineering and Environmental Science	EES-12
Anas Owda	Nancy Liu-Sullivan	Biology	BIO-11
Sam Pakravan	Charles Liu	Physics and Astronomy	PHY/AST-02
Daniel Palmieri	Sarah E. Berger	Psychology	PSY-03
Victoria Paskevich	Alfred Levine	Engineering and Environmental Science	EES-16
Justin M. Peterkin	Sarang Gopalakrishnan	Physics and Astronomy	PHY/AST-01
James Petruccio	Chandan Acharya	Management	MGT-02
Nicholas W. Pilacinski	Chang-Min Kim	Engineering and Environmental Science	EES-07
Joshua Pinedo	Heidi Bertels	Management	MGT-01
Veronica P. Pistek	Edward Miller	Media Culture	MC-03
Alexarae Pomaro	Regina Gonzalez-Lama	Nursing	NRS-02
	Regina Gonzalez-Lama	Nursing	NRS-03
Camille Ponce	Regina Gonzalez-Lama	Nursing	NRS-02
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Michael Reynolds	Jennifer Guinta	Psychology	PSY-14
Ricaute E. Rogers	Sarah E. Berger	Psychology	PSY-04
Cindy Rong	Soon Ae Chun	Marketing	MKT-01
Caroline Saad	Florette Cohen	Psychology	PSY-07
Michelle W. Saad	Sarah E. Berger	Psychology	PSY-02
Stanly M. Sachin	Alfred Levine	Engineering and Environmental Science	EES-15
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Karen Youssef	Florette Cohen	Psychology	PSY-07
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Hanna Youstina	Florette Cohen	Psychology	PSY-07
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