Ramapo College's Virtual Ninth Annual

SCHOLARS' WEEK

A CELEBRATION OF STUDENT CREATIVITY & SCHOLARSHIP

Join us for our Virtual Scholars' Week on
APRIL 12-16, 2021

*Oral presentations, panel presentations, posters,
and remarks from Deans and the Provost will be viewable at*

https://www.ramapo.edu/scholarsweek/

Synthesize, synchronize, and spark!

RAMAPO COLLEGE OF NEW JERSEY

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View the abstract and poster presentations here.
https://www.ramapo.edu/scholarsweek/

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Ramapo College's Virtual Ninth Annual
SCHOLARS' WEEK
A CELEBRATION OF STUDENT CREATIVITY & SCHOLARSHIP

Ramapo College's Ninth Annual Scholars' Week: A Celebration of Student Creativity and Scholarship is an opportunity for the entire community to celebrate our students' creative and scholarly achievements. Sponsored by the Office of the Provost, Scholars' Week showcases some of the most exemplary faculty-mentored student creativity and scholarly activities undertaken in 2020-21. The event includes both poster and oral presentations. This year thirty-three student submissions were accepted for the Scholars' Week presentations. Twenty-three of these thirty-three students were able to submit their work, overcoming the obstacles posed by the unusual times in which we continue to live and flourish. Five of these students were selected by the Dean of each of the College's schools from finalists nominated by faculty through Conveners to make oral presentations of their work. Seventeen majors are represented, with project topics ranging from College Football Recruiting Using Machine Learning Techniques to Haitian Vodou as a Crossroads: Symbolism and the Intersection of Place, Time, and Space, to A Systems View of Terrestrial Invasive Species: Problem, Prevention, and Management.

A juried event, each poster represents the support of the convening group of the major or minor associated with the project and the dedication of a faculty mentor. Additionally, the Dean of each school selected one student's work to be presented as both a poster and an oral presentation. Scholars' Week is an annual event held near the end of each spring semester. By tradition, this event was a one-day afternoon celebration of posters and oral presentations, including the Ramapo community, students, parents, faculty, and staff. In order to accommodate our current virtual delivery, we have presented events as a week-long celebration. View all posters and the pre-recorded presentations here. **https://www.ramapo.edu/scholarsweek/**

SCHOLARS' WEEK SCHEDULE
APRIL 12–16, 2021

DAY 1 | MONDAY, APRIL 12, 2021
Opening address

Welcome! by Provost Gaulden and Committee Chair, Joel Weissman

DAY 2 | TUESDAY, APRIL 13, 2021 | 6 P.M. - 7 P.M.
Live interview with all poster submitters

Poster Presentations: Live Question & Answer Session

https://ramapo.webex.com/ramapo/j.php?MTID=m277c6526988a48c4431ca11fff22b952

DAY 3 | WEDNESDAY, APRIL 14, 2021 | LIVE, 1-2:30 P.M.
Oral Presenters Q&A session

Oral Presentations: Live Question & Answer Session

https://ramapo.webex.com/ramapo/j.php?MTID=m14523777bf9f943f6a7a5833059e9c11

Watch the pre-recorded presentations before the Q&A available below

DAY 4 | THURSDAY, APRIL 15, 2021
Closing Remarks: Deans

Deans from each school speak about research at liberal arts colleges

DAY 5 | FRIDAY, APRIL 16, 2021
Recordings of all week events available for review all-day

Message from the Provost

Dear Students, Faculty, and Friends,

Scholars' Week was established nine years ago at Ramapo College to bring together students and faculty from across the schools in celebration of our students' creative work and scholarly research. Like you, I was sincerely looking forward to hearing the presentations, talking with students and their faculty mentors, and meeting family and friends at this year's event. While we cannot gather in the same room as we have in the past, I am thrilled that the Scholars' Week Committee has organized a way to showcase our students' oral and poster presentations. It speaks to our community's perseverance and inventive ways in which we are now connecting with one another.

I invite you to watch the videos and read the posters online. This year, Scholars' Week presentations embody Ramapo's mission of interdisciplinarity and experiential learning. There is a tremendous variety in the work presented. Where else can you explore, in one place, topics such the images of resilience captured during this year living in a pandemic, analysis of economic changes in Nepal and Liberia, animations representing physics, emergent phenomena in biology and electronics, the impact of state religion on religious tolerance, the relationship of Aristotle and feminist philosophy, and more?

I am immensely proud to be part of the Ramapo community and am thoroughly impressed by the way we have all continued to adapt.

Thank you to Professor Joel Weissman, Chair of the Committee, and the entire Scholars' Week Committee, for their hard work: Professors Carrie Miller, Dolly Sacristan, Malavika Sundararajan, and Marta Vides Saade. Thank you to all faculty mentors, for your tireless efforts and support of your students. Thank you to all the friends and family members who will celebrate with us.

Finally, thank you to all of the Ramapo students who submitted an abstract and congratulations to all whose work was accepted for Scholars' Week. This is a wonderful academic achievement, and I applaud you for your academic excellence, persistence, and dedication.

Wishing you all the best,
Dr. Susan Gaulden
Interim Provost/Vice President for Academic Affairs

ORAL PRESENTATIONS
View the pre-recorded videos here.
https://www.ramapo.edu/scholarsweek/

Join us here for a live Question and Answer Session with the Student Scholars selected by their Deans to represent their schools, as they respond to questions about their Oral Presentations on

WEDNESDAY, APRIL 14 | 1-2:30 P.M.

https://ramapo.webex.com/ramapo/j.php?MTID=m14523777bf9f943f6a7a5833059e9c11

ANISFIELD SCHOOL OF BUSINESS
Evidence on the Determinants of the Food Price Fluctuations in Liberia
Student Presenter: Lumana Shakya
Faculty Mentor: George Gonpu

SCHOOL OF CONTEMPORARY ARTS
The Apple Doesn't Fall from the Tree
Student Presenter: Sela Stazzone
Faculty Mentor: Joel Weissman

SCHOOL OF HUMANITIES AND GLOBAL STUDIES
The Rise and Fall of Students for a Democratic Society
Student Presenter: Lauren Stroch
Faculty Mentor: John Gronbeck-Tedesco

SCHOOL OF SOCIAL SCIENCE AND HUMAN SERVICES
The Impact of a Labor Union's Strategies on Job Crafting of Home Care Workers In NYC
Student Presenter: Lina Gershovich
Faculty Mentor: SeonMi Kim

SCHOOL OF THEORETICAL AND APPLIED SCIENCE
Evaluating Micro- and Macro-Plastic Concentrations on NJ Coastal Beaches
Student Presenter: Natalie Chung
Faculty Mentor: Carrie Miller

POSTER PRESENTATIONS

View abstract and poster presentations here:
https://www.ramapo.edu/scholarsweek/

Join us here for a live Question and Answer Session with the Student Scholars responding about their Poster Presentations on

TUESDAY, APRIL 13 | 6-7 P.M.

https://ramapo.webex.com/ramapo/j.php?MTID=m277c6526988a48c4431ca11fff22b952

ANISFIELD SCHOOL OF BUSINESS

Financial Inclusion and Economic Growth in Nepal
STUDENT PRESENTER: Pratistha Adhikari
FACULTY MENTOR: George Gonpu

Evidence on the Determinants of the Food Price Fluctuations in Liberia
STUDENT PRESENTER: Lumana Shakya
FACULTY MENTOR: George Gonpu

Can State-Level Leading Economic Indicators Explain Okun's Law?
STUDENT PRESENTER: Eric Sorger
FACULTY MENTOR: Timothy Haase

SCHOOL OF CONTEMPORARY ARTS

ESBL Producing Enterobacteriaceae found in Postoperative Meningitis
STUDENT PRESENTER: Jennifer Holland
FACULTY MENTOR: Ann LePore

Covid: Pin the Life of a Pandemic
STUDENT PRESENTER: Tatiana Mehos
FACULTY MENTOR: Joel Weissman

Drugs vs. Cancer
STUDENT PRESENTER: Sean Morgan
FACULTY MENTOR: Ann LePore

The Visualization of Information
STUDENT PRESENTER: Dan Opitz
FACULTY MENTOR: Ann LePore

How the Rise in Mass Shootings Affects College Students' Feelings of Security
STUDENT PRESENTER: John Slocum
FACULTY MENTOR: Satarupa Dasgupta

The Apple Doesn't Fall from the Tree
STUDENT PRESENTER: Sela Stazzone
FACULTY MENTOR: Joel Weissman

Elastic Electron Scattering from Methane Molecule
STUDENT PRESENTER: Grace Velarde
FACULTY MENTOR: Ann LePore

SCHOOL OF HUMANITIES AND GLOBAL STUDIES

Haitian Vodou as a Crossroads:
Symbolism and the Intersection of Place, Time, and Space
STUDENT PRESENTER: Courtney Alonzo
FACULTY MENTOR: Iraida López

State Suppression:
State Religion as an Explanatory Variable for Religious Intolerance
STUDENT PRESENTER: Phillip Pillari
FACULTY MENTOR: Hassan Nejad

The Rise and Fall of Students for a Democratic Society
STUDENT PRESENTER: Lauren Storch
FACULTY MENTOR: John Gronbeck-Tedesco

Reading Aristotle through a Retrieval and Historical Lens
STUDENT PRESENTER: Natalie Tsur
FACULTY MENTOR: Marta Vides Saade

SCHOOL OF SOCIAL SCIENCE AND HUMAN SERVICES

A Systems View of Terrestrial Invasive Species:
Problem, Prevention, and Management
STUDENT PRESENTER: Cory Fichtenbaum
FACULTY MENTORS: Ashwani Vasishth, Michael Edelstein

The Impact of a Labor Union's Strategies
on Job Crafting of Home Care Workers in NYC
STUDENT PRESENTER: Lina Gershovich
FACULTY MENTOR: SeonMi Kim

SCHOOL OF THEORETICAL AND APPLIED SCIENCE

College Football Recruiting Using Machine Learning Techniques
STUDENT PRESENTERS: Colette Barca, Keith Osani, Nisha Srishan, William Wulster
FACULTY MENTOR: Osei Tweneboah

Comparison of classification report metrics & time complexity for multiclass classification models
STUDENT PRESENTER: Aditya Bhandari
FACULTY MENTOR: Eman Abdelfattah

Evaluating Micro- and Macro-Plastic Concentrations on NJ Coastal Beaches
STUDENT PRESENTERS: Natalie Chung, Bernice Amankwah, Chris Arenas,
Walter Chang, Rachel Mason, Arya Sasne, Amanda Cruz
FACULTY MENTOR: Carrie Miller

Investigating the biofilm formation of the bacteria Pseudomonas aeruginosa in a polymicrobial setting
STUDENT PRESENTERS: Reilly Goodwin, Stacey Hauk
FACULTY MENTOR: Kokila Kota

Patterns of forest tree mortality following a native insect outbreak in the New Jersey Highlands
STUDENT PRESENTER: James Liao
FACULTY MENTOR: Eric Wiener

Effect of Topological structures on the spectrum of a magneto-elastic ribbon
STUDENT PRESENTER: Subin Mali
FACULTY MENTOR: Catalin Martin

Predicted Shifts in Tree Species Composition in a Mixed-Hardwood Forest Following a Native Insect Outbreak in the New Jersey Highlands
STUDENT PRESENTERS: Anne Ortlieb, Christian Cifuentes, Kathleen Lonnie
FACULTY MENTOR: Erick Wiener

An Ontology for Psychological Ownership to Predict Organizational Ambidexterity
STUDENT PRESENTER: Shreeti Shrestha
FACULTY MENTOR: Nikhil K. Varma

ABSTRACTS

View the abstract and poster presentations here:

ANISFIELD SCHOOL OF BUSINESS

STUDENT PRESENTER: Pratistha Adhikari
MAJOR: Economics
FACULTY MENTOR: George Gonpu
DISCIPLINE: Economics
SCHOOL: Anisfield School of Business
PROJECT TITLE: Financial Inclusion and Economic Growth in Nepal

ABSTRACT

Financial inclusion is the ease of access and availability of formal financial products and services –credit, insurance, payments, savings, and transaction facilities– to individuals and businesses. Coined by The World Bank as a "key enabler to reducing poverty and boosting prosperity", financial inclusion has been growing in popularity as a crucial factor for economic development in low-income countries. Through providing easier access and appropriate services to everyone, including the poor, financial inclusion is expected to reduce transaction costs and inefficiencies, increase productivity, and promote economic development. In Nepal, providing banking services for the "unbanked" population, especially from the country's rural region, remains a big challenge. This research investigates supply-side factors that limit financial inclusion. Additionally, it studies the impact of financial inclusion on economic development in Nepal.

The research finds that only 17 out of 75 districts in Nepal had commercial bank branches higher than the average of 16, while 12 out of 75 districts had only 2 commercial bank branches. The results also show an unequal distribution of bank branches throughout districts in Nepal with high concentration in urban areas, including Kathmandu. Besides, based on the district-level data from the Nepal Census 2011 and Nepal Human Development Report 2014, the number of commercial bank branches has a strong positive correlation with Per Capita Income (PCIN). Further analysis of data and literature shows that inefficient allocation and expansion of banking services undermines financial inclusion in Nepal. The results also provide support for the hypothesis that financial inclusion promotes economic development; notwithstanding empirical research using a regression analysis, including district level cross-sectional study of Nepal is required to draw conclusions and policy recommendations.

STUDENT PRESENTER: Lumana Shakya
MAJOR: Economics
FACULTY MENTOR: George Gonpu
DISCIPLINE: Economics
SCHOOL: Anisfield School of Business
PROJECT TITLE: Evidence on the Determinants of the Food Price Fluctuations in Liberia

ABSTRACT

Liberia has had a long struggle with high food prices. In 1979, violent protests, known as Rice Riot, broke out against the hike in the price of rice that eventually led to a military coup and was followed by more than two decades of civil unrest. Sanctions and pressures from the international community caused the Liberian president to resign and a peace agreement among the warring factions ended the civil war in 2003. Notwithstanding, the 2008 global food crisis put a tremendous setback against Liberia's transition towards development. In 2014, the Ebola epidemic left a catastrophic effect on its food prices and food security. In 2020, COVID-19 resulted in over 40 percent increase in food prices and left Liberia

in a vulnerable position due to its already weakening socio-economic condition. Although unstable food price is a central issue in Liberia, there is limited study on this topic focused on Liberia. Understanding the price dynamics is important in policy formation and, therefore, this study sought to examine the determinants of food price fluctuations in Liberia. Oil price and exchange rate are identified as two main contributors to the rise in food prices. The long-term and short-term relationship between Liberian food price indices and the two variables—oil price and exchange rate— are examined using the Johansen cointegration method and vector error correction mechanism. The analysis suggested a positive long-term relationship between both food price fluctuations and depreciation of Liberian dollar, and food price fluctuations and oil price. In the short run, only the exchange rate was found to have a significant effect on the movement in food prices. In the light of the evidence found, the study concludes with the suggestion that the role of exchange rate should be considered when forming policies to address the instability of food prices.

STUDENT PRESENTER: Eric Sorger
MAJOR: Finance
FACULTY MENTOR: Timothy Haase
DISCIPLINE: Economics
SCHOOL: Anisfield School of Business
PROJECT TITLE: Can State-Level Leading Economic Indicators Explain Okun's Law?

ABSTRACT

Okun's Law is a widely accepted and validated negative relationship between real GDP and the unemployment rate. Researchers have continually expanded upon the magnitude of Okun's Law in varying specifications of the relationship. I add to the literature by incorporating the Leading Economic Index (LEI) to explain changes in the unemployment rate. I build upon previous regional studies within the United States to investigate the magnitude differences for each region established by the Census Bureau. I employ statewide panel data in each region to improve the efficiency of real GDP and the LEI as opposed to using the more generic regional data. Economic variables such as the unemployment rate have many influential factors and using panel data allows the model to capture the effects of these factors that may be missed in the aggregated national data. One of the estimation issues that appears in panel data is biasedness estimators but using the Seemingly Unrelated Regression (SUR) technique corrects for the biasedness. I show that the LEI and GDP have a significant negative relationship with unemployment. I determine that for every 1 unit increase in the LEI results in a regional unemployment rate change between -0.45 and -0.97. Likewise, for every 1 percent change in real GDP produces an unemployment rate change between -0.004 and -0.008 respectively. Okun's Law is a crucial relationship for policy makers to determine to proper set of actions to mitigate increases in the unemployment rate. Leveraging new data series such as the LEI can elevate the positive influence these policy makers have on the macro economy. These findings are consistent with previous research as well as modern literature on Okun's Law discussing the changes in magnitude and the specification of models.

SCHOOL OF CONTEMPORARY ARTS

STUDENT PRESENTER: Jennifer Holland
MAJOR: Visual Arts
FACULTY MENTOR: Ann LePore
DISCIPLINE: Visual Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: ESBL Producing Enterobacteriaceae found in Postoperative Meningitis

ABSTRACT

My animation is about postoperative meningitis and how it infects the membranes surrounding the brain. For this project, I believe the most difficult part was to imagine what the authors were explaining in their research visually. There is not much information about intraventricular injections easily available, so I had to spend a lot of time researching how this method works. Through many diagrams and videos explaining the treatment (and the anatomy of the brain), I connected everything like puzzle pieces. Having models, cameras, and subtitles is what brings this animation together. My skills as an artist allowed me to observe and synthesize complex data into an easy-to-understand visual.

STUDENT PRESENTER: Tatiana Mehos
MAJOR: Visual Arts
FACULTY MENTOR: Joel Weissman
DISCIPLINE: Visual Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: Covid: A Year in the Life of a Pandemic

ABSTRACT

Covid: A Year In The Life of A Pandemic is a photo series that investigates the human spirit's resilience. What inspired this series were the questions that flooded our culture as the Pandemic threatened to severely change our culture once we were on the other side of it. How long will we need to stay at home? When will we be able to get back to work? What do we know about this? How do we stay safe? How will online classes work, and what effects will they have on students? Why can't I find toilet paper anywhere? Over the course of this Pandemic, I am grateful to have a camera by my side to capture and expose the world in which Covid-19 would loom over. I documented the changes Covid-19 made in our daily lives. These images tell a powerful story of businesses that didn't make it, the ones that slowly reopened with new restrictions, and the lack of people in once highly populated places.

STUDENT PRESENTER: Sean Morgan
MAJOR: Visual Arts
FACULTY MENTOR: Ann LePore
DISCIPLINE: Visual Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: Drugs vs. Cancer

ABSTRACT

In my animation, I took some information from research about a new drug that helps fight against cancer better than the older one and show the process of said newly developed drug inhibitor being injected into the body to deal with the tumors that lead to cancer on the organs that would normally be impossible to treat with the older drugs I had mentioned before. In the animation, I have the camera dynamically following the drugs as it flows through the bloodstream to the organs that have the harmful tumors all over themselves. The camera does a run around of the organs showing how each of the drug pieces goes after a grotesque-looking tumor piece and pulls it away from the organ, leaving it completely healthy with little to no side effects. To go into some detail about my project, I decided

to personify the drug and make it look like a living creature so that it looks like little people have been injected into the body to save it from harm as well as to give off a more cartoonish fun type of feeling to the whole thing and as I had mentioned before I tried to make the tumors look as nasty as possible to show how awful they are for the body to have while having everything else in friendlier colors to give off a good feeling. The camera goes fast and dynamic at the beginning to simulate how fast the drug is going through veins but has a slow runaround when it gets to the organs to show the process in a slow organized way. It ends with one of the drug boys giving a nice wave goodbye to emulate how mentioned in the research there are less harmful side effects.

STUDENT PRESENTER: Danielle Opitz
MAJOR: Visual Arts
FACULTY MENTOR: Ann LePore
DISCIPLINE: Visual Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: The Visualization of Information

ABSTRACT

This project pertains to the creation of visuals for the purpose of understanding information. When information is only presented in a written manner, it can be difficult to fully grasp for those both familiar and unfamiliar with the terminology being used. For information that cannot be observed with the naked eye, like the inner workings of a cell, creating visual representations from the imagination can aid in people's comprehension of a topic. This project creates a process for interpreting and visualizing written information for recently published medical research on farnesyl dimethyl chromanol's impact on colon cancer stem cells. When starting this process, it is important to decide how to make a figure or scene identifiable, clear in action, clear in result, and aesthetically pleasing. In my visuals of how farnesyl dimethyl chromanol impacts colon cancer stem cells, I chose to start with the one figure that can be seen under a microscope. Spheroids are a cell structure visible under a microscope. I kept the imagined visual close to its actual color and left the structure identifiable when looking between the video and original research. The rest of the visuals are imaginary and use complementary colors and slow pacing to keep information distinct and aesthetically pleasing. Captions provide clarification for all structures and actions in the video. The use of animation keeps the action of how things may be happening from being ambiguous and presents a clear ending result. This project aims to provide a process for making imaginative visual representations for otherwise unseeable events to promote the understanding of information.

STUDENT PRESENTER: John Slocum
MAJOR: Communication Arts
FACULTY MENTOR: Satarupa Dasgupta
DISCIPLINE: Communication Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: How the Rise in Mass Shootings Affects College Students' Feelings of Security

ABSTRACT

This study reflects how the recent spike in mass shootings affects American college students' feelings of security, specifically at Ramapo College of New Jersey. A thorough literature review was conducted using studies and academic journals relating to mass shootings, student psychology, guns on campuses, and how they compare to each other. Mixed-method research was conducted, using both qualitative and quantitative research. An eight-question survey was administered to fifty Ramapo College students. Semi-structured interviews were conducted with five Ramapo College students as well. All participants involved in the study were between 18-22 years of age and gave the researcher informed consent. An analysis of the results will show that a majority of Ramapo College students' feelings of security

are somewhat significantly affected by the recent spike of mass shootings. Also, a majority of Ramapo students lack confidence in the campus' public safety officers in the event of a mass shooting. Students have given insight into what would make them feel more comfortable on campus, including proper training for public safety officers, active shooter drills, and the installation of shooter-proof technology in classrooms and dormitories. Students have also shared their opinion on arming public safety officers with firearms, which concluded with somewhat evenly divided survey results. In this uneasy climate concerning gun violence across America, our college students are not only at risk of physical harm but psychological harm as well.

STUDENT PRESENTER: Sela Stazzone
MAJOR: Visual Arts
FACULTY MENTOR: Joel Weissman
DISCIPLINE: Visual Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: The Apple Doesn't Fall from the Tree

ABSTRACT

The project encompasses a series of ceramic tree sculptures that integrates augmented reality technology with traditional art-making. The clay sculptures are hand-built using the coil method, a technique as old as humans themselves. Clay supports are used for the internal structure to blend the base and the tree branches seamlessly. Augmented reality (AR) is a process that takes computer-generated images and animation and superimposes them into the real world. AR elevates visual and sensory reactions that would not otherwise be possible through a traditional ceramic installation. "The Apple Doesn't Fall Far from the Tree" is a commonly used phrase to describe a person having similar characteristics to someone they look up to. They mimic their behavior, thoughts, and actions. This installation takes the phrase and alludes to the recent partisan political climate in the United States. The animations' simplistic designs and the complexity of the ceramic sculptures will complement each other in their physical and digital space.

STUDENT PRESENTER: Grace Velarde
MAJOR: Contract Major
FACULTY MENTOR: Ann LePore
DISCIPLINE: Visual Arts
SCHOOL: School of Contemporary Arts
PROJECT TITLE: Elastic Electron Scattering from Methane Molecule

ABSTRACT

I created a 3D animation that visualizes the article called *Elastic Electron Scattering from Methane Molecule in the Energy Range from 50–300 eV* from the International Journal of Molecular Sciences published by MDPI in 2021, whose research was conducted by Jelena Vukalovíc, Jelena B. Maljkovíc, Karoly Tökési, Branko Predojevíc, and Bratislav P. Marinkovíc. The animation can be found at the included link: https://vimeo.com/515953853.

This realistic research visualization of a recent particle collision experiment based on the crossed-beam technique that takes place in a vacuum chamber conducted this year showcases my unique process as an artist studying animation, film, and computer science with interest in physics to study, dissect, and analyze and depict this original research article. It demonstrates my ability to synthesize and digitally illustrate what is unseen to the naked eye. With 2D edits made in the post-production phase, including text and voiceovers, the video simplifies an elaborately descriptive new experiment. Everything from the camera navigation to the use of colors and materials was meticulously chosen to make the final product easy to follow to those who have not read the research article. I used my artistic license of creative thinking and imagination to make this scientific experiment come to life and present this material to the audience in a short time frame.

SCHOOL OF HUMANITIES AND GLOBAL STUDIES

STUDENT PRESENTER: Courtney Alonzo
MAJOR: Nursing
FACULTY MENTOR: Iraida López
DISCIPLINE: Spanish Language Studies
SCHOOL: School of Humanities and Global Studies
PROJECT TITLE: Haitian Vodou as a Crossroads: Symbolism and the Intersection
of Place, Time, and Space

ABSTRACT

While it is evident that Haitian Vodou is a product of creolization, that is, transculturation in the new world, analysis of the symbolism, syncretism, history, and spirituality of Vodou reveals that the religion functions as an intersection of segments within various planes. Vodou is not only the product of collisions between cultural groups, as it is well established that Vodou traditions are heavily influenced by French Catholicism, but also of timelines and spiritual realms. This research visualizes this compound intersection as a crossroads, emphasizing fluidity, movement, and travel. The image of a crossroad is also embedded within vodou iconography and is worth examining in connection with this argument. This is accomplished through an examination of the prominent use of the cross and the role of the *lwa* Legba. *Lwa* are Vodou spirits and intermediaries between practitioners and the deity Bondye. The syncretism mentioned here refers to the combination and fusion of elements from different cultures within which the ethnic and religious components are emphasized in order to identify the most relevant points of convergence. The history of Haiti provides the lens through which to view this syncretism, as well as the simultaneous evolution and progress of Vodou as a means of survival and resilience. The spiritual aspect is the final intersecting dimension that demonstrates how fluidity through space and time is an integral part of how Vodou practitioners are able to interact with higher beings. The dual concept of *Gine*, a spiritual world, is also discussed as it serves as the home of the *lwa* as well as the role of the African homeland. As an example of creolization, the layered history of Vodou and its interwoven religious elements allow for the description of the religion as a union between regions, periods, and states of being.

STUDENT PRESENTER: Phillip Pillari
MAJOR: Political Science and Philosophy
FACULTY MENTOR: Hassan Nejad
DISCIPLINE: Political Science
SCHOOL: School of Humanities and Global Studies
PROJECT TITLE: State Suppression: State Religion as an Explanatory Variable for Religious Intolerance

ABSTRACT

In this paper, I challenge the use of Muslim population size as a causal variable for religious intolerance. I propose we change that variable to the existence of a state-sponsored religion. I conduct a qualitative analysis of the scholarly literature, state constitutions and statutes, and news reports to examine the levels of religious persecution in Lebanon, Indonesia, and Iran. I find states will persecute religious minorities more when there is a state-sponsored religion. For that reason, we should use the existence of a state-sponsored religion as an independent variable in a model predicting religious persecution. I also propose that this variable be coded as either ordinal or scale so that we can account for varying levels of religio-political entanglement with the state religion.

STUDENT PRESENTER: Lauren Storch
MAJOR: History and American Studies
FACULTY MENTOR: John Gronbeck-Tedesco
DISCIPLINE: American Studies
SCHOOL: School of Humanities and Global Studies
PROJECT TITLE: The Rise and Fall of Students for a Democratic Society

ABSTRACT

This paper will examine the rise and fall of Students for a Democratic Society during the 1960s and into the 1970s. One of the most prominent organizations, Students for a Democratic Society, emphasized ideas about participation, individuality and supported the rejection of Cold War ideologies. SDS dramatically grew their numbers over a short period of time, creating spaces throughout the country for students to protest, argue and speak freely about the issues they faced. Through an analysis of its founding documents such as the Port Huron Statement and the ideologies of leaders like Tom Hayden, this paper aims to lay out the various issues that ultimately lead to the organizations collapse. Differences in beliefs and the practices of protests began to create a split within the organization with some looking towards a more radical approach. These violent factions tarnished the reputation of SDS as a peaceful organization and became both a danger to themselves and their communities. Although many remained committed to its founding principles for as long as they could, in the end the organization split into two groups, the Progressive Labor Party and the Revolutionary Youth Movement. SDS laid the groundwork for modern political activism, and its legacy remains essential to the narrative of liberation movements. However, in looking at the timeline of events and people who contributed to the organization, it is clear why SDS ultimately failed. This paper will allow for a better understanding of how differences in opinion and a lack of organizational authority contributed to a movement such as SDS growing too large to be controlled by any one group.

STUDENT PRESENTER: Natalie Tsur
MAJOR: Communication Arts
FACULTY MENTOR: Marta Vides Saade
DISCIPLINE: Philosophy
SCHOOL: School of Humanities and Global Studies
PROJECT TITLE: Reading Aristotle through a Retrieval and Historical Lens

ABSTRACT

Philosophers have long discussed the implications given in Aristotle's pedagogy, concluding whether or not he should be remembered as a misogynist. Their findings depend on a blend of analyzing Aristotle's idea of virtue and his depiction of *oikos* in relation to *polis*. This led to a rather divisive conversation between those who reject and those who accept his work that the author parses. This publication contributes a coherent view of the debate and its respective arguments, separated into two sections: advocates for reading Aristotle through either one, a feminist or two, a historical lens. The former critiques Aristotle for perpetuating a gendered hierarchy and the explicit compromise of female capability. She concludes that those who defend Aristotle, however, find that the social values promoted in ancient Greece vindicate his propagation of a limited female authority. This reviewer highlights that both arguments have gained support, and though the discord remains unsettled, many feminist virtue ethicists acquiesce in their decision to source Aristotle's work.

SCHOOL OF SOCIAL SCIENCE AND HUMAN SERVICES

STUDENT PRESENTER: Cory Fichtenbaum
MAJOR: Environmental Studies
FACULTY MENTORS: Ashwanti Vasishth, Michael Edelstein
DISCIPLINE: Environmental Studies
SCHOOL: School of Social Science and Human Services
PROJECT TITLE: A Systems View of Terrestrial Invasive Species: Problem, Prevention, and Management

ABSTRACT:

Invasive species, also known as non-native or nonindigenous species, are plants, animals, insects, or microbes which are brought from one place to other locations or are moved from one region to the next, intentionally, or accidentally, negatively impacting the environment, economy, and human health. Plant or terrestrial invasive species form a complex, self-sustaining system that, through competition, can ruin or endanger native plants, ecological communities, and ecosystems. Looking at the terrestrial invasive species through a system perspective will allow us to learn and accurately define the problem and clarify the interconnections and its resulting effect on native plants. Identification of nonnative plant locations and degree of invasiveness will guide points of intervention. Management of invasive species will require education, prevention, funding, as well as government, non-government and volunteer interventions, management, and restoration of native plants.

STUDENT PRESENTER: Lina Gershovich
MAJOR: Social Work
FACULTY MENTOR: SeonMi Kim
DISCIPLINE: Social Work
SCHOOL: School of Social Science and Human Services
PROJECT TITLE: The Impact of a Labor Union's Strategies on Job Crafting of Home Care Workers in NYC

ABSTRACT

This study aims to explore how organizational strategies of a labor union affect the job crafting of home care workers, who are underpaid and overwhelmingly women of color. Job Crafting refers to the process of workers proactively crafting their job designs by changing task, relational, and cognitive boundaries. This study conducted in-depth interviews with six female home care workers who are members of the 1199 SEIU labor union in NYC. 1199 has provided its members with educational/leadership training and scholarship, advocacy and bargaining activities, relationship-building opportunities, mental health counseling, and health care insurance. This study found that job training and educational programs promoted task and cognitive crafting. They applied what they learned from training to their tasks and extended their tasks in order to better satisfy their clients' needs. In addition, they began to think of themselves as a professional and developed aspirational career plans. Leadership training encouraged them to pursue a higher level of involvement in 1199 and to voluntarily take more tasks like being a delegate and inspiring other members to be more involved in 1199. Through this process, they began to consider themselves agents who bring changes into their work environment. Relationship-building opportunities and advocacy activities promoted interviewees' relational and cognitive crafting. By participating in diverse meetings arranged by 1199, they began to value other members of 1199 like a family and to engage in mutual-help and advocacy activities. This led to cognitive crafting in that they began to believe that they have power because they are protected by 1199 and can change policies and work environments by working together. These results imply that labor union support can be important for precarious workers who lack individual resources and power to develop job crafting, which proactively changes their work environment and the meaning of their job.

SCHOOL OF THEORETICAL AND APPLIED SCIENCE

STUDENT PRESENTERS: Colette Barca, Keith Osani, Nisha Srishan, William Wulster
MAJOR: Data Science
FACULTY MENTOR: Osei Tweneboah
DISCIPLINE: Data Science
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: College Football Recruiting Using Machine Learning Techniques

ABSTRACT

College football is big business. To create a winning team that will continue to generate revenue, Division I Football Bowl Subdivision (FBS) Power Five schools need to choose their recruits wisely. Recruits are selected based on certain player attributes. Power Five schools are the most frequented schools by NFL scouts, making these schools highly desired by recruits. In this regard, we built a model to predict whether a high school recruit will commit to a school in one of the Power Five Conferences. Such a model could allow a school to optimize its recruiting process, maximizing its return on investment. We used our dataset to fit several machine learning models. We determined the Random Forest model produced the best results when applied to the testing set, as it splits observations using only the most influential predictor from a subset of the predictors for each internal node and decorrelates its produced trees. This model revealed which particular attributes are indisputably the most important predictors of commitment to a Power Five school. Based on our findings, we think this model could be successfully used to improve the recruiting process.

STUDENT PRESENTER: Aditya Bhandari
MAJOR: Computer Science
FACULTY MENTOR: Eman Abdelfattah
DISCIPLINE: Computer Science
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: Comparison of classification report metrics & time complexity for multiclass classification models

ABSTRACT

The fused dataset of Bi-temporal optical and UAVSAR radar readings is crucial for classifying crop types over an agricultural region. These factors are used to obtain crop maps with great accuracy. This research analyzes the time complexity, accuracy, precision, recall, F_1 score and confusion matrices for various machine learning models. These models are Random Forests, Support Vector Machines, Linear Regression, Decision Trees, Logistic Regression and Stochastic Gradient Descent. Each conducted experiment is on data with temporal and radar readings. A classification report is analyzed for each model. Metrics such as precision, recall, F_1 score, and support count are obtained from the report to determine the strengths and weaknesses of each model. The results demonstrate that the random forests model outperforms the other models.

STUDENT PRESENTERS: Natalie Chung[1,2], Bernice Amankwah[2], Chris Arenas[2], Walter Chang[2], Rachel Mason[2], Arya Sasne[2], Amanda Cruz[2]
MAJOR: [1]Biology, [2]New Jersey STEM Scholars participants
FACULTY MENTOR: Carrie Miller
DISCIPLINE: Environmental Science
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: Evaluating Micro- and Macro-Plastic Concentrations on NJ Coastal Beaches

ABSTRACT

Over the past decade, increasing amounts of microplastic debris have started to accumulate in the marine environment, becoming an emerging critical environmental issue. It is known that many organisms who live near or in bodies of water inadvertently consume microplastics with its impact on biological systems not well understood. To quantify the scope and magnitude of this issue and to track the proliferation of microplastics and macroplastics, preliminary measurements were made in an attempt to quantify plastic concentration at a number of New Jersey beaches. Two sampling protocols were used in the study – one taken from the National Oceanic and Atmospheric Association (NOAA) Marine Debris Program and the other from the Save Coastal Wildlife Foundation for deep and surface level sand sampling respectively. As a result, both sampling methods yielded the highest concentrations of macroplastics at the Long Branch Beach site. The greatest microplastic concentration was detected at the Asbury Park Beach site using the surface sampling method, however, there was no detectable amount using the deep sampling protocol. Although no definitive conclusions can be made, this preliminary work provides a basis for future studies and to raise awareness for this serious environmental issue. In addition to disseminating information about the problem at hand, it is equally as important to work towards finding solutions. Some promising new forms of technology such as artificial intelligence and membrane bioreactors are possible methodologies to study this issue, underlying the importance of a multidisciplinary collaborative approach to a complex problem.

STUDENT PRESENTERS: Reilly Goodwin, Stacey Hauk
MAJOR: Biology
FACULTY MENTOR: Kokila Kota
DISCIPLINE: Biology
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: Investigating the biofilm formation of the bacteria
Pseudomonas aeruginosa in a polymicrobial setting

ABSTRACT

Several microbial species exist as polymicrobial biofilm communities co-operating rather than single plankotic forms. Biofilms are a hallmark feature of various opportunistic pathogenic bacteria that allow them to communicate with each other both intra-species and inter-species via quorum sensing. We are interested in exploring the quorum sensing phenotypes of the bacteria Pseudomonas aeruginosa in a polymicrobial setting. P.aeruginosa is an opportunistic bacterium that often results in serious infections in immune-compromised patients. This nosocomial pathogen produces many virulence factors which are under the regulation of the quorum-sensing gene circuit. Two of the very important virulence phenotypes that we are interested in are the production of the blue-green pigment pyocyanin and the ability to form biofilms. Our previous work suggested that there is a difference in pigment production when Pseudomonas is co-cultured with other gram-positive/negative bacteria. As a continuation of this work, we are currently looking at another quorum sensing phenomenon which is the biofilm formation of the bacteria in a polymicrobial setting. We are especially interested in the biofilm co-culture of Pseudomonas with another nosocomial bacteria Staphylococcus aureus. Both are very well known to cause severe chronic infections in burn wound patients and lung infections in clinical settings.

Our preliminary results indicate that the polymicrobial biofilms are not only more complex/stronger than the single-species biofilms but also show much more resistance to the antibiotic treatment in-vitro. Our studies are aimed at a long-term goal to identify and understand at the molecular level the importance of developing anti-biofilm agents targeting polymicrobial communities rather than the plankotic bacteria. Future experimental efforts will be focused on identifying differential gene expression of the quorum-sensing genes of the bacteria Pseudomonas in a co-culture model. The research will be an important contribution to the evolving field of anti-microbial peptides targeting bacterial biofilms and bacterial quorum sensing.

STUDENT PRESENTER: James Liao
MAJOR: Environmental Science
FACULTY MENTOR: Eric Wiener
DISCIPLINE: Environmental Science
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: Patterns of forest tree mortality
following a native insect outbreak in the New Jersey Highlands

ABSTRACT

In 2015-2016, many chestnut oak trees (Quercus montana) were defoliated during an unusual outbreak of oak leaf roller insects (Archips semiferanus) in the New Jersey Highlands. The purpose of this study was to document the degree of forest canopy disturbance caused by mortality of chestnut oaks following the outbreak. In the autumn of 2020, a survey was conducted of all canopy and subcanopy trees that had died since 2015 in a 33.4-hectare study area within one forest tract at Apshawa Preserve (West Milford, NJ). Results of the survey revealed 544 dead chestnut oaks and 264 dead trees of other species, most of which were other oak species that died due to other natural causes. The estimated combined canopy area of all dead chestnut oaks was 56,963 m2, which represents a substantial portion (11.8 %) of the forest area surveyed. The scale of disturbance is remarkable, given that the estimated total canopy area of all other dead trees suggested an approximate background mortality rate of only 0.9 % canopy disturbance per year. Furthermore, the spatial distribution of the dead trees in the survey was statistically significantly clustered, implying that forest processes triggered by newly created canopy openings may be particularly accelerated in some areas of the forest. Interestingly, the dead trees in this survey do not appear to be spatially correlated with a previous survey of tree mortality following a spree of severe storms in 2011-2012. Therefore, only a relatively small area of the forest went without impact from either the oak leaf roller insect outbreak or the severe weather events of the past decade.

STUDENT PRESENTER: Subin Mali
MAJOR: Engineering Physics
FACULTY MENTOR: Catalin Martin
DISCIPLINE: Engineering Physics
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: Effect of Topological structures on the spectrum of a magneto-elastic ribbon

ABSTRACT

Soft ferro-magnetic materials are well known and much used in the current technology and industry. High malleability and low coercivity of amorphous ferromagnetic alloys allow for a wide range of applications in electronics. Due to these properties, soft ferro-magnetic materials can also be used to study the effects of defects or regulated imperfections on a resonant frequency spectrum. Currently, the study of surface and bulk defects in crystals or regular periodic systems is becoming a major subject of theoretical and experimental investigation. Emergent phenomena induced by the defects have multiple practical applications ranging from development in topological materials to advancements in electronics. Hence, new adaptable and inexpensive methods to probe the effects of the defects on a system may

be of interest. In this experiment, we induce controlled defects and create regulated patterns in the ferro-magnetic strip to study their effects on the frequency spectrum. We propose a new adaptable and inexpensive method to explore the effects of topological structures. We present here examples of such structures and their effects on the resonant spectrum of the ferro-magnetic strip.

STUDENT PRESENTERS: Anne Ortlieb, Christian Cifuentes, Kathleen Lonnie
MAJOR: Environmental Science
FACULTY MENTOR: Eric Wiener
DISCIPLINE: Environmental Science
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: Predicted Shifts in Tree Species Composition in a Mixed-Hardwood Forest Following a Native Insect Outbreak in the New Jersey Highlands

ABSTRACT

Oak tree populations in forests of the northeastern United States have been impacted in recent decades by a variety of invasive herbivores and diseases. For example, chestnut oaks (Quercus montana) recently experienced substantial mortality in the New Jersey Highlands due to an oak leaf roller (Archips semiferanus) insect outbreak in 2015-2016. The purpose of this study was to determine whether the tree species composition of the forest canopy is likely to change in one forest stand where substantial tree mortality occurred. Surveys of tree seedlings and saplings were conducted beneath 21 large canopy openings where at least four neighboring chestnut oaks had died in a mixed-hardwood forest at Apshawa Preserve (West Milford, NJ). A model based on the largest saplings beneath each canopy opening was used to predict which tree species will likely replace the dead chestnut oaks. Results revealed that black birch (Betula lenta) and red maple (Acer rubrum) are likely to replace 30 % and 21 % of the dead chestnut oaks, respectively. Only 17 % of the dead chestnut oaks are likely to be replaced by other chestnut oaks, and only 35 % will likely be replaced by oak trees, in general. Substantial variation in the density of regenerating trees existed among the canopy openings, suggesting spatially complex ecological outcomes. Canopy opening area was significantly, negatively correlated with juvenile tree density for the four most common tree species, likely due to the intense competition for increased light availability. Overall, this study provides strong evidence that tree species composition at the study site was impacted by the oak leaf roller outbreak. Given that oaks produce acorns that are critical for a wide variety of wildlife and oak leaves are host to a great diversity of insect species, declining oak populations are of particular concern.

STUDENT PRESENTER: Shreeti Shrestha
MAJOR: Computer Science
FACULTY MENTOR: Nikhil K. Varma
DISCIPLINE: Computer Science
SCHOOL: School of Theoretical and Applied Science
PROJECT TITLE: An Ontology for Psychological Ownership to Predict Organizational Ambidexterity

ABSTRACT

Ambidexterity in an organization is associated with positive organizational performance (Junni, Sarala, Taras, & Tarba, 2013; Peng, Lin, Peng, & Chen, 2019) and organizational sustainability (Sulphey & Alkahtani, 2017). The study of ambidexterity has originated from the seminal article by Duncan (1976) which identifies organizational innovation driven by structural ambidexterity, context ambidexterity and leadership ambidexterity. The structural ambidexterity aims at focusing on organizational units to perform separate activities simultaneously (Gibson & Birkinshaw, 2004). Contextual ambidexterity proposes that organizations should balance exploration and exploitation without separation (Fang, Lee, & Schilling, 2010). The leadership ambidexterity studies the impact of leadership styles in the ambidexterity initiatives in the organizations (Baškarada, Watson, & Cromarty, 2016). It is important

to note that all these different types of ambidexterity have several interacting factors. Conceptual frameworks for studying and explaining the degree of ambidexterity have been common in management literature (Damanpour, 1991; Kimberly & Evanisko, 1981; Raisch & Birkinshaw, 2008). The different research in the past studied the structural parameters and then moved on to the behavioral aspects in the organizations such as culture (Cao, Gedajlovic, & Zhang, 2009) and then more specifically the behavior of the people in the organization (Nemanich & Vera, 2009). Organizational decision making has changed with the growth of analytics (Sharma, Mithas, & Kankanhalli, 2014). With digitization of processes and communication, organizations have a myriad of data that is continuously being captured and some research has focused on studying ambidexterity phenomenon from big data (Bøe-Lillegraven, 2014; Nel, Milburn-Curtis, & Lehtisaari, 2020). These studies mostly focus on the structural ambidexterity and context ambidexterity, but there are very few studies concerning data analytics in the leadership ambidexterity context (Tsai, Poquet, Gašević, Dawson, & Pardo, 2019). Our research focuses on building an ontology for leadership ambidexterity, more specifically on the psychological ownership. Studies have shown that the psychological ownership of leaders have an influence on the ambidextrous initiative in the organization (Lee & Kim, 2020). This study will enable analytical techniques to identify the ambidexterity readiness of an organization by designing an ontology for psychological ownership to predict individuals' inclination towards change.

IN APPRECIATION

Thank you to all faculty mentors, Deans, students who participated,

and staff who made this virtual week-long online delivery

so seamlessly possible, as well as to all of you who will view

and enjoy these creative and scholarly achievements!

With special appreciation to the Provost

for her continuing encouragement in these unusual times.

SCHOLARS' WEEK COMMITTEE

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