Oral Sessions

Science and Mathematics Complex (SAMC), Rooms 151, 170, 173, 175, and the Planetarium
Friday, May 5, 3:00 pm - 6:00 pm

Humanities & Social Sciences I
SAMC 173 3:00 p.m. - 4:00 p.m.

3:00 p.m. - 3:15 p.m.
• Where They Lay Their Heads at Night
Margaret De Witt, ANT 385: Visual Anthropology

3:15 p.m. - 3:30 p.m.
• The Underrepresentation of Indigenous Musical Styles in Colonial Latin America
Dynelis Santana-Quintana, Music Performance

3:30 p.m. - 3:45 p.m.
• Women Awake! American Women and Propaganda in WWI
Jaylyn Zimmer, HIS 356: World War I

3:45 p.m. - 4:00 p.m.
• The Appropriation & Misrepresentation of the African American Culture
Madison Bryant-Wagstaff, FTT 450: Global Issues in Fashion and Textile Industry

Humanities & Social Sciences II
SAMC 175 3:00 p.m. - 4:00 p.m.

3:00 p.m. - 3:15 p.m.
• Land of 10,000 Lines: An Examination of Sean Daley's Songwriting
Nolan Hagen, SPC 321: Rhetorical Criticism

3:15 p.m. - 3:30 p.m.
• A Successful Buffalo Sports Team: An Oxymoron and Truth
Daniel May, COM 495: Directed Sports Research

3:30 p.m. - 3:45 p.m.
• Effects of Foreign Imposed Regime vs Internal Imposed Regime Change on Its Populace
Cristian Schuster, International Relations

3:45 p.m. - 4:00 p.m.
• Liberalization of State Cannabis Policies Results in Decreased Crime Marked with Significant Variation
Alexandria Erbes, Political Science

Humanities & Social Sciences III
SAMC 173 4:00 p.m. - 5:00 p.m.

4:00 p.m. - 4:15 p.m.
• Do I Love You or Do I Love Us?
Daniel Guercio, PHI 308 Philosophy of Love and Sex

4:15 p.m. - 4:30 p.m.
• Owning Self: Freedom and Community in Toni Morrison's Beloved and Marlon James The Book of Night Women
Anthony Skubis, English

4:30 p.m. - 4:45 p.m.
• Hurricane Fiona Aftermath in Puerto Rico: Communities Post-Fiona
Yamilla Tate, Music Performance/English Literature

Humanities & Social Sciences IV
SAMC 175 4:00 p.m. - 5:00 p.m.

4:00 p.m. - 4:15 p.m.
• Fumble Rumble – A Study of Football Consumption in America
Keontae Key, COM 450: Communication and Society

4:15 p.m. - 4:30 p.m.
• Comparing United States' Prison System to Sweden's
Skylar Mckelvie, COM 450: Communication and Society

4:30 p.m. - 4:45 p.m.
• Understanding Predictors of Recidivism in Incarcerated Individuals in Western New York
Morgan Harrington, PSY 499: Evaluating Peaceprints Data

4:45 p.m. - 5:00 p.m.
• Prenatal Substance and Child Sex
Olivia Bell, PSY 496/498

Math I
SAMC 170 3:00 p.m. - 4:00 p.m.

3:00 p.m. - 3:15 p.m.
• Forecasting Time Series Data-Stock Index Analysis
Prayushi Bhorania, AMT 495: Applied Mathematics Project

3:15 p.m. - 3:30 p.m.
• Predicting the Future: Time Series Analysis of the S&P 500 and the Federal Reserve Rate
Conor Cahill, AMT 495: Applied Mathematics Project

3:30 p.m. - 3:45 p.m.
• World Hunger: Optimization of Transportation Costs
Lance Swiatek, AMT 495: Applied Mathematics Project

Math II
SAMC 170 4:00 p.m. - 5:00 p.m.

4:00 p.m. - 4:15 p.m.
• Determinants and Tournaments
Jenna Wlostowski, MAT 491

4:15 p.m. - 4:30 p.m.
• Transcendental Numbers: All the Numbers We Know Nothing About
Tahmid Rafiyo, MAT 491

4:30 p.m. - 4:45 p.m.
• The Number e
Jacob Haskell, MAT 491

4:45 p.m. - 5:00 p.m.
• Predictors of Juvenile Myopia
Shannon McGrath, AMT 495: Applied Mathematics Project

Math III
SAMC 170 5:00 p.m. - 6:00 p.m.

5:00 p.m. - 5:15 p.m.
• Moving Toward a Gas-Free Future in NY Buildings
Tyler Body, MAT 495

5:15 p.m. - 5:30 p.m.
• How a Planimeter Works
Capri Webster, MAT 491: Capstone Research

5:30 p.m. - 5:45 p.m.
• History and Applications of Geometric Probability
Joseph Colson, MAT 491: Capstone Project

5:45 p.m. - 6:00 p.m.
• The Panel Analysis of Buffalo State University's Decreased Enrollment
Tatiana Shaddi, AMT 495: Applied Mathematics Project

Planetarium
SAMC Planetarium 4:00 p.m. - 5:00 p.m.

4:00 p.m. - 4:15 p.m.
• Research Aspect of COSMOS III
Makaih Rivas, ENT 466: Electrical Design II

4:15 p.m. - 4:30 p.m.
• Wendy Carlos: The Original Synth
Lindsey Roth, DMP 491: Capstone in Digital Music Production

4:30 p.m. - 4:45 p.m.
• Maximizing MAX
Steven Shaneyfelt, Arts & Letters

4:45 p.m. - 5:00 p.m.
• Laser Show Production: How to Balance Entertainment and Education
Sam Hellert, Zalue Saylee, Allison Panek, Erin Zeller and Steven Shaneyfelt, GES 495: Laser Show Production Class

Science and Engineering
SAMC 151 3:00 p.m. - 4:00 p.m.

3:00 p.m. - 3:15 p.m.
• Green Oxidative Deprotection of Hydrazones and Oximes by Mesoporous Manganese Oxides
Michael Vullo, Chemistry

3:15 p.m. - 3:30 p.m.
• Different Control Strategies for Variable Frequency Drives
Joshua Van Lew, Electrical Engineering Technology, Smart Grid

3:30 p.m. - 3:45 p.m.
• Application of Cyber Physical Systems in Automation Control
Gedion Melesse, Electrical Engineering Technology

3:45 p.m. - 4:00 p.m.
• Organizing Science Kits
Summer Grandinetti, Early and Childhood Education

Poster Sessions

Science and Mathematics Complex (SAMC) Atrium
Friday, May 5, 3:00 pm - 6:00 pm

Poster Session I
SAMC Atrium 3:00 p.m. - 4:00 p.m.

- Aleksandr Goedicke's Russian Pièce du Concours
  Christopher Bailey-Robinson, MUS 303: Music History 2

- Alma's Adagietto: Gustav Mahler and His Symphony no. 5
  Jonathan Golba, MUS 303: Music History 2

- The Beginning of Loom Weaving in the Neolithic Near East
  Robert Winslow, FAR 499: Independent Study in Art History

- Biblical Bernstein: Theological Meaning in Leonard Bernstein's Symphonic Works
  Aneris Rivera-Wagner, MUS 303: Music History 2

- Brain, Soul, and Spirit: From the Holodomor to the Russia-Ukraine War
  Anne-Sophie Hellman, HIS 300

- Brewing Revolution: Coffee, Coffeehouses, and the American Revolution
  Tyler Troyer, HIS 300: Research and Writing Seminar

- Buffalo's Filthy Problem: Hygiene
  Khadara Wright, SWK 301: Poverty and Public Policy

- Canned Tuna Advertising History in the Twentieth Century United States
  Jonathan Prell, HIS 300

- Certain Adverse Childhood Experiences Predict Eating Behavior in Adulthood
  Victoria Sasso, Psychology

- Characterization of Silver Nanoparticle Aggregates Using Raman and UV-Vis spectroscopy
  Kayla Issurdatt, FOR 495

- Chronic Cannabis Usage and Its Effects on Cortisol
  Brent Howes, Psychology and Kavorn McKoy, Psychology

- Comparison of Gold Nanoparticle Aggregation Through Quick Freezing vs. Salt Addition
  Jillian Tung, Chemistry

- Correlates of Cannabis Use and Self-Control Across a Diverse Sample of College Students: 2020-2022
  Francesca Giaquinto, Psychology

• Cultural Differences in Teachers' Perceptions of Classroom Aggression
Olivia Bell, IPDS Dominican Republic

• Depression and Poverty in Queens
Rayana Johnson, SWK 300: Poverty and Public Policy

• Dominican Republic: Classroom Behavior & Management
Janinna Farragher, EDU 380

• E-Motion: Exploration of Movement & Identity on Film
Olivia Gianadda, FAR 420: Advanced Photography

• The Effect of Peer Victimization on Young Children's Prosocial Behavior
Coralie Theogene, Psychology and Breonna Pierce, Psychology

• The Effect of Laboratory Stressors on Food Intake
Kavorn McKoy, Psychology and Brent Howes, Psychology

• Effect of Cognitive Dietary Restraint on Stress Reactivity and Caloric Intake
Tamari-Rose Love, Psychology and Cecelia Redding, Psychology

• Effect of Race and Emotion on Perceived Sexual Assault Credibility
Jamie Ervolina, Psychology

• Effects of Food Type on Cortisol
Taha Ghadeer, Brittany Campanella and Morgan Harrington, PSY 495

• Exploring the Cosmos: Gustav Holst and The Planets
Keith Vantino, MUS 303: Music History 2

• Exploring Woodhenge: Archeoastronomy at Cahokia
Sara LeBarron, ANT 499: Independent Study in Anthropology

• Eyes Wide Open: The Hotel Industry Has 20/20 Vision
Elizabeth Urmson, HTR 368: Hotel Operations

• Get One's Patients in a Row
Joseph Kuschke, CIS 494: UG Research in Computing

• Getting Canned: The American Canned Food Industry during the 1900s to 1920s
Desire Tubbins, HIS 300: Research and Writing Seminar

• Grapefruits and Cabbage Soup: American Fad Diets of the Mid-Twentieth Century
Abby Marks, HIS 300

• Internet Store: Time to Go for Shopping
Andriy Martynyshyn, CIS 494

• John Williams and His Film Score for Schindler's List
Sebastiano Lombardo, MUS 303: Music History 2

• Manganese Oxides for Selective Oxidation Reactions: Stoichiometric vs Catalytic
Jonathan Grant, Chemistry

• Mental Health Discrimination and Poverty in Buffalo
Farhio Abshir, SWK 301: Poverty and Public Policy

• Music Mates: The Relationship Among Mozart, Stadler, and the Clarinet
Gabriella Colton, MUS 303: Music History 2

• The New Buzzkill: Urban Yellowjackets in Western New York
Jonathan Promowicz, Biology

• No More Housing for the Rest of Us
Elijah Eden, SWK 300: Poverty and Public Policy

• Otgoʔa:ʔ: The Connection Between Indigenous Beadwork and American Capitalism
Kashmir Bowser, ANT 495: Beadwork Presentation

• Pepsi's Rise to the Top During the 1980s
Ryan Sherk, HIS 300

• Port Is Open!
Farah Al-Karkhi, CIS 494

• Poverty and Housing: Why Can’t I Afford a Simple Home?
Dalton Demblewski,

• Poverty and Hunger in Buffalo
Ryan Gallant, SWK 301: Poverty and Public Policy

• Poverty and Racism: The Downfall of Buffalo
Briasia Wilson, SWK 300: Poverty and Public Policy

• The Relationship Between Adverse Childhood Experiences and Moral Development
Adrianus Wutz, Psychology, Lindsay Prout, Psychology, Xiamara Brooks, Psychology and Ashlynd Cox, Psychology

• Senior Project in Photography: Fashion Magazine
Julianne Guercio, FAR 499

• Sexism in Women's Wages
Allison Morey, SWK 301: Poverty and Public Policy

• Social Exclusion and Sexual Victimization in College Students: The Role of Gender
Alyssia Schwab, Psychology

• Social Media Use, ADHD and Academic Performance
Jennifer Mitsuyama Brandenberger, Alexis Bilotta and Dania Abdulrahman, PSY 488

• Spam: Becoming an American Cultural Icon
Daniel Sorge, HIS 300

• Walking the Rover
Eric Barton, CIS 494

• School Responses to Teen Dating Violence
Daisy Ambrusko, Social Work

• My Body, Whose Choice?
Elizabeth Evans, Sociology

Poster Session II
SAMC Atrium 4:00 p.m. - 5:00 p.m.

• 2022 Buffalo State COSMOS Rover
Benjamin Kempa, Zachary Shine and Xavier Baker, ENT 422: Machine Design II

• Abortion Around the World: Abortion Rates and U.S. Hegemony
Talia Peeler, PSC 470

• Ackee and Saltfish from Slave Food to National Dish in Jamaica
Rashad Panton, HIS 300

• African American Soul Food: Colonial and Civil War Era, 1619-1865
Morrigan Waller, HIS 300

• Antibacterial Properties of the Pyrazine-Piperazine Derivatives
Jadelene Adams, Biology

• Austin Air Purifier
Kyle Kwietniewski, John Huebschmann, Travis Moriarty and Brett Warren, ENT 422: Machine Design II

• Bel Canto Vocalism & The Italian Swan
Julia Kuk, MUS 303: Music History 2

- Belle Chic's Midnight Blues Is a Collection That Every Woman Needs to Be Talking About
  Julia Jugoon and Kayeelah Ephraim, FTT 358: Fashion Forecasting

- Cashmere Republic: A Shopping System
  Fahim Alam, CIS 494: UG Research in Computing

- Changes in Wind Direction as Recorded by Aeolian Landforms Near Gill Crater, Mars
  William Woiccak, Earth Sciences

- A Cloud-Based Communication Framework for Rover Control System
  Ryan Duell, CIS, Eric Barton, CIS and Yongjun Lee, CIS

- College Connect App
  Khallid Barber, CIS

- Effects of RNF4 Interactions with Poly-SUMO Chain Modification Signals on SENP6–Mediated SUMO Chain Disassembly
  Samantha Wild and Suraiya Efa, BIO 495: POLY-SUMO-2/3 CHAIN

- Exclusionary Zoning in Erie County
  Cameron Murphy, PLN 499: Geography of Housing Affordability

- Exploring the Unknown Information about Preparing for Death and Dying
  Sonia Swann, Social Work

- Financial Overparenting and Financial Self-Confidence Among College Students
  Brent Howes, Psychology

- Focus
  Zachary Hellwig, Analog and Stop Motion Picture

- From Exotic to Mainstream: An Historical Overview of Sushi in America
  Zachary Wier, HIS 300

- Functional Magnetic Materials for Energy Application
  Asraf Sawon, Electrical Engineering, Jacob Casey, Physics, Noah Kramer, Electrical Engineering, Christopher Burgio, Physics and Grace Brzykcy,

- Geriatric Geopolitics: Age, Corruption, and National Birth Rates
  Kai Phanhthalath, PSC 470

- Growth and Investigation of Barium Titanate Thin Films
  Abrar Fayaz, Physics

- Haute Atelier: An Unconventional Take on Streetwear Fashion
  Emelia Seiferth and Saisruthi Ravishankar, FTT 358: Fashion Forecasting

- Heal Thyself? Healthcare Lobbying and the US Senate
  Melissa Levandoski, Political Science

- Magnetic and Transport Phenomena of Single-Crystalline Rare-Earth-Based Kagome Magnet
  Christopher Burgio, Jacob Casey, Asraf Sawon, Jamaal Huff and Noah Kramer, PHY 295

- Mahler at the Metropolitan: First-Person Testimony
  Gabriella Colton, MUS 303: Music History 2

- Mechanisms by Which Inhibition of SUMO Modification Induces Chromatin Bridges
  Lucas Schultz, Alif Noor and Ann Oshei, BIO 499: Independent Study

- Microstructures in Deformed Metamorphic Rocks, Coastal Maine: Did the Porphyroblasts Rotate Relative to the Matrix Mineral Fabrics?
  Colin Krzystek, Earth Science

- The Moderating Role of Entrapment & Hope on the Relationship Between Risk Management & Suicide Ideation.
  Adrianus Wutz, PSY 496/498

- Muscle Dysmorphia, Eating Disorders, & Orthorexia: Possibly One Diagnosis
  Natasha Renczkowski, Psychology

- Not For Your Aesthetic Pleasure: Alban Berg's Wozzeck
  Nathan Reiser, MUS 303: Music History 2

- Out of This World!
  Matthew Nunez and Taylor Grad, ENT 422: Machine Design II

- Please Don't Shut Off Our Electricity: Facing Utility Issues in Buffalo
  Elizabeth Denis-Torres, Poverty and Public Policy

- Poverty in Buffalo Public Schools
  Andrew Laughlin, SWK 301: Poverty and Public Policy

- Predicting Student Dropout: Analysis of Big Data
  Mukhtar Mabruk, CIS

- The Relationship Between Fixed Mindset and Mental Health Stigma
  Connor Rohan, PSY 498: Honors Thesis II

- Religious Freedom and LGBTQI+ Rights: A Pattern of Human Rights Adherence
  Cassandra Brown, Political Science

- Representations of America Post-9/11: Sam Raimi's Spider-Man 1 and 2
  Frank Pennesi, CWP 102

- Riot! A Deep Dive into Stravinsky's Ballet The Rite of Spring
  Lucas Diermyer, MUS 303: Music History 2

- SAE Mini Baja: An Engineers Competition
  Nicholas White, Joseph Wikar, Oscar Handley, Edwin Diaz, Rodger Powers and SoeSoe Aye, ENT 422: Machine Design II

- Starting the Race a Mile Back
  Gillian Scozzaro, SWK 301: Poverty and Public Policy

- Study of the World Happiness Report
  LaRue Heutmaker, PSC 470: Senior Seminar

- Surviving the Storm: Lessons Learned from the Blizzard of '22
  Margaret Bilquin, Jamie Bommer, Chloe Ciranni, Ralph Garret, Kelley Hoffman, Patrick McMahon-Eagan, Madison Palmatier, Destiny Rivera, Joseph Rodriguez, Mykayla Williams and Sunny Willis, GEG 386: Weather & Society

- Transportation: Not for Travelling Americans
  Jordan Nass-deMause, SWK 300: Poverty and Public Policy

- Using Ground Penetrating Radar to Search for a Buried Lake Freighter at Tifft Nature Preserve
  Dylan Maciejewski, William Woiccak, Colin Krzystek, Grace Brzykcy, Chelsie McKinnie and Angela Nye, GES 471: Geology Research Seminar

- Variations in Cold Season Soil Respiration and Carbon Dynamics
  Robert Salefske, BIO 498: Honors Research

- Virtual Reality Maze
  Anthony Turello, CIS 494

- Developing an Inducible Stable Cell Line to Investigate Polymeric SUMO Chain Signaling
  Alif Noor, Biology

- Cultivation of Synechococcus and Subcloning of Ribonucleotide Reductase Gene
  Angelina Wheeler, Biology

- Synthesizing Novel Magnetic Materials for Cooling Technology
  Noah Kramer, Electrical Engineering, Christopher Hanley, Physics, Cora Kubiak, Physics and Alessia Provino,

• The Potential of Feminist Metaphysics: Analysis Through Creative Non-Fiction
Madeline Crosby, English/Individualized Studies

Poster Session III
SAMC Atrium 5:00 p.m. - 6:00 p.m.

• Ashrae Design Contest
Daniel Erckert, Ibrahim Raqib, Daniel Wendel and Matthew Gibson, ENT 422: Machine Design II

• Assessment of Social and Health Patterns in Relation to Brownfields in East Side, Buffalo
Kelley Hoffman, Jamie Bommer, Widelson Orsel, Angela Nye and Caitlyn Parsons, ENS 300: Environmental Case Studies

• Bluetooth Adapter with Android Application (B.A.W.A.A.)
Jacqueline Evans, Jovan Wiggins and Lawrence Bailey, ENT 466: Electrical Design II

• Changes in Literacy Instruction Through the Years
Cassandra Thurn, Early Childhood/Childhood Education

• Characterization of Connexin30.3 F189Y, a Mutant Associated with Erythrokeratodermiavariabilis (EKV)
Anshuman Jain, BIO 498

• Characterization of Cx30.3 and F189Y, a Mutant Associated with Hereditary Skin Disease
Ettan Saiwala, Biology

• Characterization of Heavy Metals in the Soil of Buffalo's East Side
Cooper Axelrod, Devonte Brown and Grace Brzykcy, ENS 300: Environmental Case Studies

• The Color of Water: Images from Nature in Piano Music of Debussy and Ravel
Mikayla Manke, MUS 303: Music History 2

• Concierto de Aranjuez: Joaquin Rodrigo's Musical Sphere of Influence
Christian Medina, MUS 303: Music History 2

• Confirmatory Factor Analysis of the Urgency Construct Within the UPPS-P
Catherine Sarich, PSY 295: Self-Regulation and Motivation

• Converting Analog to Digital: An FPGA and Raspberry Pi Adventure!
Lawrence Bailey, ENT 446: Digital Systems Design and Analysis

• The Creation of the FDA and the Importance of Food Safety
Melvin Scott, HIS 300: Research and Writing Seminar

• The Divine Divide: The Intersection of Theocracy and Abortion Legislation
Molly Doyle, COM 450: Communication and Society

• Drive Guys; Motors and Drives
Ruben Santana, Joshua Van Lew, Mitchell Thornton and Adam Hoffmann, ENT 466: Digital Design II

• The Effects of Nicotine on Short-Term Memory and Trial and Error Learning
Lucas Patton, PSY 498

• Ellicott: A Manual Micro Manipulator Tool
Benjamin Hartman, Kirklind Kaleta and Marvin Jackson, ENT 422: Machine Design II

• Expression and Characterization of Erythrokeratodermia variabilis (EKV: Mutants Connexin 30.3 G12D and R22H
Hanin Faisal and Zahraa Faisal, BIO 498

• From Ada Boni to the Olive Garden: The Americanization of Italian Food in the United States, 1950-2000
Jacob Fuqua, HIS 300

• Helping Hygienics: Advocating for Hygiene Essentials
Eden Harrison, Poverty and Public Policy

• How Raw is Our Sewage? Examining Treatment Plant Discharge Levels
Grace Brzykcy, GES 499: Independent Study

• Impacts of Maternal Substance Use and Perception of Infant Cries on Maternal Harsh Parenting
Olivia Bell, Psychology, Madison Kelm, , Meghan Leising, and Rina Eiden,

• Implementing Sensory Elements into Public Settings for Children with Autism
Mackenzie Muldowney, Interior Design

• Industrial Automation
Michael Avery, Electrical Design II

• Inexpensive Voltmeter and Digital Trainer Using the Arduino Electronics Platform
Diamond Hamilton, ETS

• An Integrated Assessment of Next Generation Photovoltaic Technologies
Joseph Wikar, Mechanical Engineering Technology, Nicholas White, Mechanical Engineering Technology, Leanna Tse, Electrical Engineering Technology, Michael Vullo, Chemistry and Tyler Body, Mathematics

• The Journey of Special Education in Montessori Schools
Hailee Cipollina, Exceptional Education

- Ladder of Creation: Mahler's Symphony No. 3 and Artistic Spirituality
  Alexa Wery, MUS 303: Music History 2

- Life's a Beach: RUNWAY Collection
  Imani Wint, FTT 451: Senior Collection

- Marriage of Music & Poetry: Berlioz Tells Instrumental Stories
  Cameron Juzdowski, MUS 303: Music History 2

- Mental Health Issues Among Children and Adolescents in the Dominican Republic
  Alyssia Schwab, EDU 380

- Mental Health: A Conversation About Poverty
  Alexis Creasey, SWK 301: Poverty and Public Policy

- Monitoring Hurricanes Using National Oceanic and Atmospheric Administration (NOAA) Data
  Chelsie Mckinnie, Earth Science

- Passion of the Rations: Food Distribution during World War I in the UK and Germany
  Zion Treadwell, HIS 300: Writing and Seminar

- Pax Vobiscum: Heaven on Earth in Faure's Requiem
  Melanie Bebak, MUS 303: Music History 2

- Placenta Preparation Practices: Do Human Consumers Reap Pain-suppression Benefits?
  Ashlynd Cox, Elise O'Donnell and Angie Felix, PSY 499: Independent Project

- Poverty and Hygiene: How This Affects a Community
  Delaney Reid, SWK 301: Poverty and Public Policy

- Poverty and Mental Health Don't Mix Well
  Terri-Jamel Curry, SWK 300: Poverty and Public Policy

- Poverty is Trauma is Discrimination: Mental Illness in African American Community
  Monica Michaux, Poverty and Public Policy

- Poverty, Trauma, and Mental Health Discrimination
  Shanaia Panchoo, SWK 301: Poverty and Public Policy

- Project COSMOS
  Samson Owens, Makaih Rivas, Carmen Pappaceno and Kirk Daniel, ENT 466: Electrical Design II

- Re-Imagining Coca-Cola: The Pepsi Challenge and the Failure of New Coke
  Zachary Pieczynski, HIS 300

- Research in Cell Physiology Using Hydra
  Davon James and Precious Adegor, BIO 301: Cell Physiology

- Research Review of the Montessori Method in the United States Education System
  Sofia Fanizzi, Early Childhood Education

- Serene Futurism
  Alexis Remington, FTT 451: Senior Collection

- Stabilizing the Grid: Examining the Implementation of Geothermal Heat Pumps with Battery Storage in Buffalo NY through RTDS Simulation
  Zachary Schneider, Louis Schriver, David Peiffer and Ashanti Stewart, ENT 466: Electrical Design II

- Struggles of Housing in Brooklyn
  Rebecca Laurent, SWK 301: Poverty and Public Policy

- Teacher Child Maltreatment Knowledge and Training in the Dominican Republic
  Andrea Newell, Emily Newell and Grace Gallagher, EDU 380

- Three Phase Training Module
  Fatma Alnabhani, Yeassin Arafath, Quinn Schwab and Galad Hirsi, ENT 466: Electrical Design II

- Understanding Hereditary Mutations in Connexin Channels: A Course-based Research Project in Biology
  Unique Phyall and Akintoye Akinfemiwa, BIO 314: Advanced Cell Biology

- Understanding the Historic Timeline of Segregation in Buffalo, New York
  Jamie Bommer, Kelley Hoffman, Angela Nye, Widelson Orsel and Caitlyn Parsons, ENS 300: Environmental Case Studies

- What Does It Mean to Be Clean? Hygiene
  Imani Marino, Poverty and Public Policy

Maximizing MAX

Steven Shaneyfelt, Arts & Letters
Faculty Mentor: Professor Tomas Henriques, Music
MAX MSP is a music orientated programming software that can work in a seemingly limitless number of ways. Maximizing MAX involves the building of a hardware synthesizer interface that uses a micro-controller to interact with a laptop. The laptop is used to run a program called MAX MSP in a setup that uses frequency modulation sound synthesis. In easier terms this is the building of a hardware interface that communicates with a laptop to make sounds. The sound created with Frequency Modulation (FM) synthesis is a part of many of our favorite songs that we all like to sing along to – The Final Countdown, Sandstorm, Running Up That Hill, etc. However, understanding what makes a synthesizer work can get complicated very quickly. Down to the component level, an Arduino MEGA micro-controller was programmed to respond to various inputs from users (a button pushed, a knob turned left or right) and send their values as numerical variables to the FM synthesis engine running in the laptop. Understanding how each individual knob works can be very helpful in anyone's knowledge in music technology. It could potentially be brought into a classroom environment where a student could learn both hardware skills and the rare sound knowledge that accompanies FM.

Prenatal Substance and Child Sex

Olivia Bell, PSY 496/498
Faculty Mentor: Professor Pamela Schuetze, Psychology
The purpose of this study is to examine the relationships between prenatal tobacco and marijuana co-exposure (PTME), harsh parenting, and autonomic dysregulation. Specifically, it is hypothesized that harsh parenting will mediate, and child sex will moderate the interaction between prenatal substance exposure (no substance exposure, prenatal tobacco exposure (PTE), and PTME) and autonomic dysregulation. Mother-infant dyads were recruited as part of an ongoing longitudinal study, with 81 PTE, 97 PTME, and 69 not exposed to tobacco or marijuana. Dyads participated in interviews and observational paradigms at each trimester, 2, 9, 16, 24, 36, 48 months of age, and again when the child was in kindergarten. Results from a linear regression will be used to test the mediational and moderational pathways. Results will inform intervention and prevention efforts focusing on mitigating the risks associated with prenatal substance exposure and harsh parenting. Future studies pertaining to risk factors of autonomic dysregulation and the persistence of dysregulation as the child ages will be addressed.

Developing an Inducible Stable Cell Line to Investigate Polymeric SUMO Chain Signaling

Alif Noor, Biology
Faculty Mentor: Professor Xiang-Dong "David" Zhang, Biology
Almost 25 years has elapsed since SUMO (small ubiquitin-related modifier) was found to be a reversible post-translational protein modifier. Two families of enzymes in controlling SUMOylation and deSUMOylation of numerous protein targets, respectively, have been discovered. SUMOylation plays a critical role in regulation of various cellular processes, including cell-cycle progression, DNA damage repair, gene expression, stress response, and ubiquitin-dependent proteolysis. While yeast and invertebrates contain a single SUMO protein, vertebrate express three SUMO isoforms, SUMO-1, SUMO-2, and SUMO-3. SUMO 2 and SUMO 3 are frequently referred to as SUMO 2/3 since they

are 97% identical but share only ~50% identities with SUMO 1. Importantly, SUMO-2/3, instead of SUMO-1, are observed to be conjugated to protein targets in form of polymeric SUMO-2/3 chains, which provide critical signals for accurate chromosome segregation during mitosis and DNA damage repair. However, mechanisms by poly-SUMO-2/3 chain signals in control of these processes are still poorly understood. In order to have a better understanding the main goal of the project was to establish a tetracycline-induced stable human HeLa cell line expressing EGFP-tagged four tandem SUMO-interacting motifs (SIMs) of the SUMO-targeted ubiquitin E3 ligase RNF4 for an effective detection and inhibition of poly-SUMO-2/3 chain signals. This stable cell line would allow us to test the hypothesis that poly-SUMO-2/3 chain signals are critical for DNA damage repair and accurate chromosome segregation during mitosis and cytokinesis.

The Underrepresentation of Indigenous Musical Styles in Colonial Latin America

Dynelis Santana-Quintana, Music Performance
Faculty Mentor: Professor Tiffany Nicely, Music
Although they made up a huge percentage of the population, Indigenous musical voices are conspicuously absent in historical musical publications regarding Colonial Latin America. In the 16th, 17th, and 18th centuries, historical documents in the Colonial Americas were only written and published by the Iberian settlers; these documents often came with prejudice and little desire for neutral ethical research. As historians interpreted and analyzed this material in later centuries, the musicians, writers and artists of Indigenous communities were severely underrepresented, disrespected, and oftentimes erased. My intention is to explore why this phenomenon was so prominent and how it has affected our understanding and appreciation of the Indigenous contributions to music during that period through the compilation and analysis of the research that is available. Although the research is scarce, I was able to locate: how the Inca and Aztec civilizations practiced music pre-colonialism, why music was so important in their spiritual practice, and how this transferred under colonial rule. I highlight the strategies missionaries took to attract the native population to the Catholic religion and identify why music was critical in achieving their goals. I hope to continue my research and create opportunities for further discussion on the relationship of Latin America to Western musicology.

School Responses to Teen Dating Violence

Daisy Ambrusko, Social Work
Faculty Mentor: Professor Jessica Fitzpatrick, Social Work
The prevalence of teen dating violence (TDV) is a hidden crisis in middle and high schools, affecting at least a third of teenagers across our country. Teen dating violence involves intentional harm or abuse between young people in a romantic relationship. It causes low self-esteem, depression, drug abuse, and poor mental health and has the potential to end in fatality. However, schools implementing awareness campaigns and intervention measures have successfully reduced the occurrence and effects of teen dating violence. This research reflects how middle and high schools in Erie and Niagara counties are responding to this crisis. 107 middle school and high school counselors were contacted by phone to participate in a qualitative study to evaluate the perceptions and responses to teen dating violence in schools. Twenty-eight counselors from Erie County, seven counselors from Niagara County, and two resource officers were interviewed for the study. This study revealed that only 36% of middle and high schools acknowledge that TDV is a problem in their school, and only 19% have mandated staff training for school violence. However, 86% of counselors interviewed stated that students and staff would benefit from the presence of an

outside organization in the school to train staff on TDV. Furthermore, this research indicates that there is much to be done to mitigate the prevalence of TDV in our school systems. This research will be summarized in a report that will be shared with local domestic violence agencies interested in engaging in teen dating violence prevention education in schools.

Liberalization of State Cannabis Policies Results in Decreased Crime Marked with Significant Variation

Alexandria Erbes, Political Science
Faculty Mentor: Professor Peter Yacobucci, Political Science & Public Administration
The liberalization of cannabis laws has gained increased popularity across the United States. Currently, the recreational use of cannabis has been legalized in nineteen states and Washington D.C., as well as being considered at the federal level. The legalization of recreational cannabis often follows the medicinal legalization and decriminalization of marijuana in many states. This research seeks to discover whether states that have liberalized their marijuana laws, in conjunction with decriminalizing cannabis, witness a decrease in various crime rates and crime recidivism rates in the years following this change. The existing literature suffers from a lack of data hindering the ability to draw valid conclusions on the lasting impact of cannabis liberalization. A few studies have found a statistically significant relationship between the legalization of recreational marijuana and a decrease in various crime rates, while others found no change in crime rates following such a change. Most studies limit their analysis to a single state or a single crime hindering the generalizability of their findings. In addition, no conclusive evidence has been forwarded concerning the impact of liberalizing marijuana laws on long-term recidivism rates. The creation of a temporally longer and more extensive data set first attempted by this research allows for scientifically valid policy outcome results. This research suggests the liberalization of cannabis laws results in a decrease in various crime rates. However, this result displays great variability across a number of factors. Our research suggests the causality of these results and provides avenues for future research.

The Potential of Feminist Metaphysics: Analysis Through Creative Non-Fiction

Madeline Crosby, English/Individualized Studies
Faculty Mentor: Professor Staci Newmahr, Sociology
My research explores the way that the genre of creative non-fiction can be a mode to unpack the concepts of feminist metaphysics while challenging Europatriarchal epistemologies. Feminist metaphysics examines the ways that the metaphysical answers about the construction of the universe and reality can work to prop up sexism and other injustices. I used creative non-fiction to gather a deeper understanding of the frameworks that contribute to our interpretation of the world and how they impact our understanding of the nature and conventions of gender. This methodology holds promise to be useful and relevant within feminist writings due to its fluid nature. I conducted two immersive literature reviews to facilitate my research on feminist metaphysics and creative non-fiction. Through these methods, I worked to write exploratory pieces of creative non-fiction that work to unpack feminist metaphysics in a more fluid and less academic approach. This prompts the understanding of the connection between gender and genre and the potential for fluidity in both of these areas. This pairing contributes to a deeper understanding of the ways in which our social reality exists and works to destabilize the gender binary. This works towards a future that will be more transitory and fluid in its approach to gender and sexuality, or a trans future. Through the lens of creative non-fiction, this presentation will examine the dichotomy between metaphysical

structures created by language and the fluidity of gender, genre, society, and language. It will also explore the ways that gendered language affects our thoughts and actions and how we can move towards trans futures by shifting language to be more fluid.

Effects of Foreign Imposed Regime vs Internal Imposed Regime Change on Its Populace

Cristian Schuster, International Relations
Faculty Mentor: Professor Mehwish Sarwari, Political Science & Public Administration
Is regime change effective in promoting human development? While existing literature has explored how regime change affects political and economic development, there is limited research on its effects on human development. This study seeks to address this gap in the literature by examining the impact of ‘foreign-imposed regime change’ (FIRC) interventions and ‘internally imposed regime change’ (IIRC) on human development. Specifically, I argue that although foreign interventions that seek regime change may have positive effects on creating new institutions, their effects on human development do vary. State-building structures and service institutions created during foreign interventions are viewed by local populations as illegitimate and therefore, are more likely to collapse. In countries where regime change has occurred as a result of domestic processes, institutions created to improve human development are more likely to be supported by the domestic population and thus, remain stable. Using data on education, equality, and income from the United Nations Human Development Index to measure human development, I will estimate a statistical analysis to test the relationship between FIRC and IIRC regime change and human development for all countries during the period of 1990-2008. I anticipate my findings to show that interventions that impose external regime change are ineffective in improving human development. Additionally, I expect that countries that have experienced internal regime change are more likely to exhibit higher levels of human development. In addition to making theoretical and empirical contributions to the literature on regime change and providing suggestions for future research, this study offers policy relevant insight into the consequences of foreign policy decisions on governance and development.

Owning Self: Freedom and Community in Toni Morrison's Beloved and Marlon James The Book of Night Women

Anthony Skubis, English
Faculty Mentor: Professor Lorna Perez, English
This paper considers the links between Toni Morrison’s novel Beloved and Marlon James’ novel The Book of Night Women. Both texts are neo-slave narratives that, when taken together, reveal the violence of slavery, both within the context of enslavement, and in its aftermath. Like its predecessor the slave narrative (autobiographical texts written by enslaved people), the neo-slave narrative, (a text centered on chattel slavery written by contemporary authors), draws our attention to the horror and violence of slavery. Neo-slave narratives, however, are not just forms of historical fiction; they probe both the immediate horrors of slave societies, even as they also probe the long after-effects of slavery, including state terror and institutionalized racism. Toni Morrison's Beloved and Marlon James's The Book of Night Women specifically address the issues of freedom, identity, and community inside and outside of chattel slavery. This paper argues that Sethe and Lilith’s experiences of enslavement and its attendant gendered violence leave them alienated from both the enslaved community and their own sense of self. For both women, their journeys to live within

freedom is not just about moving beyond a state of legal bondage but is also about the after-effects of slavery and the trauma of being stripped of selfhood.

My Body, Whose Choice?

Elizabeth Evans, Sociology
Faculty Mentor: Professor Jason Grinnell, Philosophy
The slogan "my body, my choice" is being used to argue for autonomy on more than one contemporary issue. It can be questioned whether those using the slogan are doing so with the same intentions. Inconsistencies among autonomy principles can be found when this slogan is used both by those supporting reproductive rights and by those supporting vaccination freedom. While both groups seem to be declaring that people should have choice over bodily issues, do they agree with one another's views? Consistency demands they should, so long as they agree upon the meaning behind the slogan and the values it promotes. Regardless of personal opinions, we must work to create a defensible and principled position that can be used in arguments regarding bodily autonomy. The principles put forth by well-known ethicists such as Judith Jarvis Thomson and John Harris can provide a solid foundation. By acknowledging and addressing inconsistencies within our own arguments we will be better equipped to have productive discussions with others instead of trading mere opinions that result in nothing but frustration. We may never agree with another person's view but if we can understand their argument and appreciate their consistency, we will have achieved something positive. This project will be presented using a poster that encourages the viewer to question their own views regarding autonomy with the goal of finding any inconsistencies, resolving them, and then having a meaningful discussion using these adjusted views.

Cultivation of Synechococcus and Subcloning of Ribonucleotide Reductase Gene

Angelina Wheeler, Biology
Faculty Mentor: Professor Olga Novikova, Biology
Inteins are intervening protein sequences that, after translation, autocatalytically excise themselves from their precursor proteins and in a process called protein splicing. They are found sporadically in essential, highly conserved proteins in all three domains of life, as well as in viruses. While inteins were once assumed to be selfish genetic elements, it is hypothesized that they may play a regulatory role in their hosts. In this project, to begin to test this hypothesis, we established a stable culture of the fast-growing cyanobacterium Synechococcus elongatus UTEX 2973, which contains an intein in the essential ribonucleotide reductase (RNR) gene. Cyanobacteria are an ancient clade of bacteria that have successfully colonized every biome on Earth and are the only bacteria capable of oxygenic photosynthesis; our preliminary computational studies show that inteins are more abundant in cyanobacterial genomes than in other groups of bacteria. From our culture of S. elongatus, we isolated the RNR gene using PCR and successfully subcloned it into competent Escherichia coli cells for future study and manipulation.

Synthesizing Novel Magnetic Materials for Cooling Technology

Noah Kramer, Electrical Engineering, **Christopher Hanley**, Physics, **Cora Kubiak**, Physics and **Alessia Provino**,

Faculty Mentor: Professor Arjun Pathak, Physics
LaFe13-xSix-derived compounds have enormous potential for applications in cooling technology enabled by their exhibition of the magnetocaloric effect, an anomalous consequence that results in the cooling or heating of material when exposed to an external magnetic field. Furthermore, the elements that compose these compounds are readily available and relatively inexpensive. This has led to a considerable amount of research into its refrigeration capabilities via its first-order phase transition (FOPT). Unfortunately, these compounds are plagued by brittleness, mechanical friability, poor thermal conductivity, and measurable irreversibility, so far these issues have not been resolved fully. Recently, Pathak et al. announced the discovery of a two-phase, naturally formed at LaFe2Si stoichiometry as opposed to the LaFe13-xSix composition. LaFe2Si displays greatly responsive behaviors while avoiding degradation in properties that can be utilized in weak magnetic fields. However, the phase transition occurs at relatively low temperatures and the saturation moment is low. Further experimentation is ongoing to idealize the phase transition temperature and enhance the magnetic and mechanical properties of the alloy. The purpose of the presentation is to report the synthesis and characterization of LaFe2-yCoySi. The LaFe2-yCoySi compound was prepared by creating the first pre-alloy of FeCoSi and then adding Co and melting multiple times. Increased homogenization was achieved by the vacuum suction casting technique, which resulted in a 4 to 5 cm long rod with a 6 mm diameter of sample. It was found that the ferromagnetic to paramagnetic transition increases from 199K for x = 0 to 273 K for x = 0.3 and the full width at the half-maximum value of magnetic entropy changes increases significantly with Co doping. We will explore the phase transition, electrical transport, magnetic, and magnetocaloric properties of LaFe2-yCoySi compounds.

The New Buzzkill: Urban Yellowjackets in Western New York

Jonathan Promowicz, Biology
Faculty Mentor: Professor Robert Warren, Biology
Urban yellowjackets, including invasive German yellowjackets (Vespula germanica) are a common component of urban landscapes. They voraciously feed on other insects, including bees and caterpillars, and can be aggressive pets around human food. Many of the urban yellowjackets, particularly V. germanica, nest in human structures, such as the walls of homes, and make use of urban landscapes. My research looked into the abundance and behavior of yellowjackets in Western New York. I separated the research into two parts: first, I set up yellowjacket traps along an urban-to-rural gradient to investigate where the yellowjackets are mostly located. Second, I placed traps on the Buffalo State campus to see if yellowjackets associate people with food. I found that most yellowjackets occurred in suburban areas in Western New York with about half as many in urban and rural areas. I also did not find that the yellowjackets had learned to associate humans with food by the end of the study period.

Microstructures in Deformed Metamorphic Rocks, Coastal Maine: Did the Porphyroblasts Rotate Relative to the Matrix Mineral Fabrics?

Colin Krzystek, Earth Science
Faculty Mentor: Professor Gary Solar, Earth Sciences
Rocks exposed in southern coastal Maine, located in the Harpswell Neck area, were formed over 400 million years ago, and then metamorphosed and deformed from about 400 to 280 million years

ago. This was within a more than 15 km-wide zone of continental collisional deformation known as the Norumbega shear zone system (NSZS) during the Acadian through Alleghenian Orogenies (mountain building during continent-continent collisions). Specimens carefully selected from a suite of rocks previously collected in the field in the Harpswell Neck area were examined to determine significance. Clear holes were then identified where samples needed to be collected from the field, which justified collection from specifically chosen field locations in the Harpswell Neck area. Evidence of the tectonic plate collisions in question exists at the grain scale and can be studied and measured through the use of polarized transmitted-light microscopy (petrography) of thin sections made from these rocks. Microstructures in all specimens were then described and measured with the main focus of the study on deformation recorded, specifically related to porphyroblasts (larger crystals) and the matrix minerals surrounding them. Compared to other similar rocks from surrounding areas, the rocks I have studied from Harpswell Neck have more porphyroblasts per thin section, and an interlocked quartz and twinned plagioclase matrix, but to a lower degree relative to similar rocks in the area. Whereas subsequent deformational events may alter or erase the matrix minerals, these inclusion minerals in the porphyroblasts are preserved and reflect the original matrix at time of growth. Throughout there is consistent correlation between porphyroblasts aspect ratio and the long-axis angle in relation to the matrix mineral pattern. The data documented shows that the extensive tectonic history within the Norumbega shear zone system was long-lived as new matrix fabrics formed over old ones progressively.

The Beginning of Loom Weaving in the Neolithic Near East

Robert Winslow, FAR 499: Independent Study in Art History
Faculty Mentors: Professor Dr. Harriet Blitzer, Art and Design and Professor Prof. Jozef Bajus, Art and Design
This project examines the origins of loom weaving in the pre-pottery Neolithic Near East (the eighth millennium BC). It includes library research in archeological periodicals and excavation reports, as well as in technical studies of the processing and use of goat hair, wool, flax, and other wild plant fibers in the prehistoric Near East. The project investigates the artifactual remains of spindle whorls and loom weights, both of stone, clay, and bone, prior to the introduction of fired clay pottery in Neolithic societies. Tools used in the carding, combing, retting, and weaving of fibers derived from fauna and plants are considered in their archaeological contexts, and in relation to artifactual assemblies of other raw materials utilized in the Neolithic Near East. This project is one element of a senior thesis for a BFA in Fibers at Buffalo State University. The intention is to design and construct a vertical wooden warp-weighted loom with fired clay loom weights, and to produce weavings for display in the student's Senior Exhibition.

2022 Buffalo State COSMOS Rover

Benjamin Kempa, **Zachary Shine** and **Xavier Baker**, ENT 422: Machine Design II
Faculty Mentor: Professor Jikai Du, Engineering Technology
We were tasked with building a rover vehicle for SUNY Buffalo State in conjunction with a fellow group of senior electrical engineering students. The electrical team’s program is called the Computer On-board Scientific Mobile Observatory System rover, or COSMOS. The goal of this project was to build a complete working model of a rover that could be used for planetary exploration. In the future, Buffalo State would like to compete in the University Rover Challenge, a competition held every year designed to test the limits of what students can engineer, design, and build into a rover vehicle platform. It requires students to work together as a group to design a mini

rover to compete against other universities from around the world. Our budget was $1000 which included the design and purchase of all materials needed to construct a rolling chassis. Our goal was to maximize our design under this constrained budget keeping in mind cost, strength, weight, manufacturability, and performance in the field. The rover was designed in part by us, the mechanical engineering students, as well as partly by the electrical engineering students. For the Fall 2022 semester, we were tasked with designing and building a complete rolling chassis, with suspension, wheels, and a usable build plate for the electrical team to create a layout of components they will need. This project is the first iteration of hopefully many COSMOS rovers to be designed, built, tested and improved upon at Buffalo State.

Ellicott: A Manual Micro Manipulator Tool

Benjamin Hartman, **Kirklind Kaleta** and **Marvin Jackson**, ENT 422: Machine Design II
Faculty Mentor: Professor Jikai Du, Engineering Technology
Assembling small electronic components on an industrial scale can pose a challenge to the teams tasked with the undertaking, as training assemblers can be an arduous task. Only the steadiest hand of the most highly trained technician can dependably and repeatedly assemble critical electronic components. The learning curve is steep to become a skilled assembler, and the road to get there can be expensive and fraught with waste due to mistakes. PCB Piezotronics, a Buffalo based piezoelectric sensor manufacturer, knows all about this, and struggles to find enough people with steady, surgeon-like hands to assemble their devices. In order to help reduce human error, they have developed a tool dubbed a manual micromanipulator that translates an input from a hand at a 4:1 ratio, allowing for steady, precise placement of electrical components during assembly processes. Unfortunately, the micromanipulator's use is currently very limited by the lack of available tool holders for its arm. We will be creating several versatile, quickly adjustable tool holders that will securely hold tools such as scalpels, soldering irons, watch oilers, and tweezers on the end of Ellicott's arm, while allowing for 90 degrees of total side to side motion of the various tools used in the microelectronics assembly process. When attending our presentation, expect to see functioning 3D printed prototypes of the various tool holders, along with shop drawings detailing their manufacture, a budget showing the total cost of the project, and a schedule demonstrating progress over the course of the project.

Changes in Literacy Instruction Through the Years

Cassandra Thurn, Early Childhood/Childhood Education
Faculty Mentors: Professor Keli Garas-York, Elementary Education, Literacy and Leadership and Professor Susanna Schenk, Elementary Education, Literacy, and Educational Leadership
Literacy instruction is a main component of education. Within this poster, we will look at the changes in literacy instruction over the span of 30 years involved in education. From changes in wording to changes in the delivery and instruction, elementary education teachers will provide their experiences with literacy instruction. Additionally, input and knowledge will be provided by a panel of teachers with as much as 30 years of experience to a recent graduate of teacher education. The goal is to determine what the future looks and holds for literacy instruction and prepare teacher candidates and current teachers for possible changes.

Where They Lay Their Heads at Night

Margaret De Witt, ANT 385: Visual Anthropology
Faculty Mentor: Professor Kimberly Hart, Anthropology
In this visual ethnographic study, "Where They Lay Their Heads at Night," I proposed to consider

how individuals' intimate living space, the bedroom, would relate to how they present themselves in public spaces. A driving force in my research is the notion that a sense of style is very personal. I was especially interested in the contrast between how they presented themselves in public versus private. The public surface of appearance is like a shell which they use to protect themselves from the outside world. It also is a means of controlling how they want to be seen. I wondered whether this outer public presentation might relate to how they express themselves in private spaces, like their bedrooms. By beginning with the core of their bedrooms, the nightstand, I explored what they kept closest to them as they slept. Considering this as a jumping off point to understanding the self, I expanded to their rooms and then to their personal styles. By employing visual ethnographic methods, I used photography and paired this with observations and interviews. Gaining permission to enter their homes and bedrooms, I asked and received permission to photograph them, their rooms, and their bedside tables. Next, I took posed portraits based on their specifications about how they wanted to be seen. Finally, I conducted interviews about themselves, their lives, experiences, sense of style, and how this related to their personal and private spaces. This study is an assignment for my Visual Anthropology course, ANT 385.

Organizing Science Kits

Summer Grandinetti, Early and Childhood Education
Faculty Mentors: Professor Julie Henry, Elementary Education, Literacy, and Educational Leadership, Professor Alayla Ende, Education and Professor Keli Garas-York, Education
Elementary teachers are expected to be ready to teach all content areas, but often science is an area that is challenging to teach, especially with new Next Generation Science Standards (NGSS). Many schools have purchased science kits full of materials that are meant to help provide engaging instruction, but teachers may struggle with making sense of the materials and getting them classroom ready. This research surveyed elementary teachers about their science kits, provided targeted assistance from a teacher candidate in “unpacking” the kit, and a post-survey. Results showed that help unpacking the kits could positively impact science in elementary schools.

Bluetooth Adapter with Android Application (B.A.W.A.A.)

Jacqueline Evans, **Jovan Wiggins** and **Lawrence Bailey**, ENT 466: Electrical Design II
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Ken Pokigo, TXRX
The Bluetooth Adapter with an Android Application project incorporates technology that is utilized on an everyday basis. The project is being developed for TX/RX Systems Inc. We were requested to integrate a power sensor with an Android application with Bluetooth for communication purposes. Presently, field engineers rely on a laptop with a hard-wired serial connection to the power sensor to collect power measurements. The Bluetooth Dongle will allow the RF technician to perform their inspections quicker, which in turn allows technicians to spend less time on site, and the company operation becomes more efficient. The project integrates existing technology by utilizing a Bluetooth Module (HC-05), a TTL voltage converter to transform higher voltages down to 3.3 volts, and the power sensor manufactured by TXRX/Combilent. The prototype built during our preliminary design confirmed the functionality of the concept. Currently, our efforts are being concentrated on the design/fabrication of the printed circuit board (PCB) for our Bluetooth Dongle and finalizing the code for our Android and Windows Human Machine Interfaces (HMIs).

Research Review of the Montessori Method in the United States Education System

Sofia Fanizzi, Early Childhood Education
Faculty Mentor: Professor Keli Garas-York, Elementary Education, Literacy, and Educational Leadership
This project is a research review of 6 articles published in the past 20 years about the Montessori Method being used in the United States. The goal of this research review is to determine if research shows that the Montessori Method of Education that was developed by an Italian educator for her Italian students works for and benefits children in the United States Education System.

Comparison of Gold Nanoparticle Aggregation Through Quick Freezing vs. Salt Addition

Jillian Tung, Chemistry
Faculty Mentor: Professor Jinseok Heo, Chemistry
The use of metal substrates has been extensively investigated as a way to enhance spectroscopic methods. Of particular note is the development of Surface Enhanced Raman Scattering (SERS), which uses metal nanoparticles to intensify the weak signals of normal Raman scattering. Aggregation of these nanoparticles (NPs), most commonly gold or silver, has been shown to further enhance the SERS signal by creating areas where analytes are subjected to the enhanced electromagnetic field of the aggregated NPs. A conventional method for NP aggregation is the introduction of a salt solution such as KCl to a AuNP solution. Another recently proposed method for the aggregation of AuNPs is Quick Freezing-Induced AuNP Aggregates (QFIAA), where the AuNP solution is quickly frozen in liquid nitrogen before thawing. To determine the efficacy of QFIAA versus salt-induced aggregates, a series of AuNP solutions were aggregated with different concentrations of KCl and analyzed with UV-Vis and Raman spectroscopy, and then compared with the UV-Vis and Raman spectra of previously prepared QFIAAs. Our results show that the QFIAA method, previously reported to be stable up to three months, does indeed produce stable aggregates, while the salt-induced method either did not cause aggregation at all, or produced unstable aggregates that showed further aggregation over time. Based on this research, QFIAAs appeared to be the preferable method for NP aggregation than salt-induced aggregates. Future study will focus on the cause of the difference between these two types of AuNP aggregates.

Representations of America Post-9/11: Sam Raimi's Spider-Man 1 and 2

Frank Pennesi, CWP 102
Faculty Mentor: Professor Michele Ninacs, English
Representations of pre and post 9/11 America are clearly evident in Sam Raimi's Spider-Man 1 and 2. The 9/11 terrorist attacks clearly changed the types of films Americans wanted to see, and the media at the time was altered to suit such interests. This change was especially prevalent in superhero films at the time, as noted by Burke, but it can especially be seen in the significant tonal differences between Sam Raimi's Spider-Man 1 and Spider-Man 2. The scholarship on the 9/11 terrorist attacks and the development of both films makes clear that there was a causal relationship. After researching the topic, including extensive reviewing of the films, I came to the conclusion that Raimi's representations of America in Spider-Man 2 were significantly influenced, if

not directly influenced by the events of 9/11. There are many key differences between these two films that can be seen, and they can be tied to how Americans were feeling after 9/11. The terrorist attacks of 9/11 completely shattered the feeling of invulnerability Americans had and completely shifted their perceptions of NYC. The original Spider-Man film was based on American perceptions and beliefs pre-9/11, whilst the sequel film is reflective of American perceptions and beliefs post-9/11. In this poster, I document the most relevant changes and distinct parallels to 9/11 that can be seen in the films.

Otgoˀa:ˀ: The Connection Between Indigenous Beadwork and American Capitalism

Kashmir Bowser, ANT 495: Beadwork Presentation
Faculty Mentor: Professor Lisa Marie Anselmi, Anthropology
Beadwork is an important aspect of Indigenous material culture. With different styles dating from the pre-Columbian era, beadwork has evolved into its own unique art form today. The history of genocide and colonization that Indigenous communities have faced means that modern-day beadwork is a link to our ancestors and a cultural connection. Many fail to realize the extensive nature of beadwork and the labor-intensive hours that it takes to make a single piece. With mass production of goods so readily available in late-stage capitalism, beadwork is often passed by and deemed too expensive for what it is. From Columbus deeming beads as “trifles of insignificant worth” (Gray 2017) to the racist formation of the United States, it is no wonder why beadwork is underappreciated in today’s market. This research focuses on the connection between the devaluing of Indigenous beadwork with the racist formations of the United States. This includes not only a monetary undervalue within the free market but a gross misunderstanding of the importance of beads to Indigenous people as well. Part of this research also includes my own beadwork done throughout the year to show the time needed to complete a beaded project. This paper explores how stories shape our values, the foundations of beadwork, how the United States attempted to eradicate this cultural tradition, and the resurgence of beadwork. Finally, bringing beadwork and American capitalism together, it explores possible reasons why this intensive art form is seen as little more than jewelry making.

The Journey of Special Education in Montessori Schools

Hailee Cipollina, Exceptional Education
Faculty Mentor: Professor Keli Garas-York, Elementary Education, Literacy, and Educational Leadership
My presentation is about the process in which students are accepted into a special education program and the services provided by both Tres Mariposas Montessori in the Dominican Republic and Bennett Park Montessori in Buffalo NY. I traveled to the Dominican Republic with Buffalo State’s International Professional Development School (IPDS) program in January. The rest of my research was conducted at Bennett Park Montessori in Buffalo NY. In both Montessori Schools, I interviewed teachers and administrators and observed in classrooms to gather information on how students become accepted in special education programs, including the testing and procedures for students. My presentation is an account of my international journey in discovering what special education looks like in different countries.

Teacher Child Maltreatment Knowledge and Training in the Dominican Republic

Andrea Newell, **Emily Newell** and **Grace Gallagher**, EDU 380
Faculty Mentor: Professor Pamela Schuetze, Psychology
Existing research in the U.S. focused on the knowledge of child abuse and reporting of teachers was found that although teachers were unsure of the legal aspects of reporting child abuse, most had training, as well as knowledge related to child maltreatment (Dinehart & Kenny, 2015). However, it is unclear what type of training teachers in other countries such as the Dominican Republic have had regarding child maltreatment. In fact, there has been little to no previous research done in the Dominican Republic regarding this topic. Social services do appear to be emerging in the Dominican Republic (Parada, Moffatt, Duval, 2007) which may be extending to educational services. This study focuses on the knowledge/training teachers have about child abuse/maltreatment and the services provided in New York and how it differs from the Dominican Republic. Participants were school personnel. A questionnaire with a 5-point Likert-type rating scale was used to measure the amount of knowledge/training these participants have on child abuse/maltreatment, ranging from strongly agree to strongly disagree. Because of the relatively recent emergence of social services in the Dominican Republic, we predict that those in the U.S. will have more knowledge and training on child maltreatment compared to those in the Dominican Republic.

Dominican Republic: Classroom Behavior & Management

Janinna Farragher, EDU 380
Faculty Mentors: Professor Pamela Schuetze, Psychology and Professor Tamara Horstman-Riphahn, School of Education
Behavior and Classroom Management strategies are very impactful educational tools that teachers can use to promote a safe, healthy, and well-rounded classroom environment. When teachers are properly trained to carry out these strategies, they are more likely to have better responses with student engagement and a better ability to deliver appropriate positive or negative consequences. A short-term study regarding teacher and administration perspectives on Behavior and Classroom Management strategies was conducted in schools in Cabarete, Dominican Republic. After interviewing the teachers and administrators, a questionnaire was given to participants asking questions about training, preferences, and strengths and weaknesses in a teacher's classroom and behavior management strategies. I also conducted observation in the classrooms. The findings of these data will be summarized and will focus on understanding the classroom behavior and management strengths and weaknesses in the Dominican Republic.

Mental Health Issues Among Children and Adolescents in the Dominican Republic

Alyssia Schwab, EDU 380
Faculty Mentor: Professor Pamela Schuetze, Psychology
The purpose of this study is to gain an understanding of mental health issues among children and adolescents in the Dominican Republic (DR). The prevalence rate for children and adolescents with mental health issues is approximately 20%. Furthermore, about 90% of children with mental health

concerns come from low- and middle-income countries. However, there is very little research that has been done regarding mental health issues among children and adolescents living in the Dominican Republic. Thus, the purpose of this study was to identify the prevalence of mental health concerns as well as the services offered to children and adolescents the Dominican Republic. I conducted structured interviews with the director of a foundation for girls and a licensed counseling social worker at a Montessori school in Cabarete, DR. The interview included questions about the types of mental health issues they see among their populations as well as about the attitude towards mental health issues in the DR. The interview also included questions about the services and resources available for children and adolescents. The findings from these interviews will be summarized and discussed in a poster presentation. I will also be discussing the implications of these findings for intervention efforts in the Dominican Republic.

Mechanisms by Which Inhibition of SUMO Modification Induces Chromatin Bridges

Lucas Schultz, **Alif Noor** and **Ann Oshei**, BIO 499: Independent Study
Faculty Mentor: Professor Xiang-Dong “David” Zhang, Biology
SUMOylation is a highly dynamic and reversible post-translational modification that plays a crucial role in the regulation of accurate chromosome segregation, DNA damage response, and genome stability. To elucidate how SUMOylation regulates these processes, we test the hypothesis that inhibition of SUMOylation in human cells by the SUMO-activating enzyme (SAE) inhibitor, ML-792, increases the percentage of cells with chromatin bridges by inducing DNA damage and activating Aurora B-mediated abscission checkpoints. Our immunofluorescence microscopy analysis by DAPI staining of DNA and anti-LAP2 antibody for labeling the nuclear membrane demonstrated that ML-792 treatment dramatically increased the fractions of cells with chromatin bridges, binuclei, micronuclei, and nuclear buds compared to the control treatment. As phosphorylated H2AX at Ser-139 residue, also known as gamma-H2AX, is a biomarker for DNA double-strand breaks, which often leads to chromosomal fusion, dicentric chromosomes, and chromatin bridges in cytokinetic cells, we are currently exploring whether treatment with ML-792 results in a significant increase of gamma-H2AX levels compared to the control treatment.

Moving Toward a Gas-Free Future in NY Buildings

Tyler Body, MAT 495
Faculty Mentors: Professor Joaquin Carbonara, Mathematics and Professor Daniel McSkimming, Data Science and Analytics
As solar photovoltaics continue to advance and become safer and more cost-effective, I plan to use predictive models to analyze future energy costs and the potential for residential solar PV implementation. By 2024, the "All Electricity Building Act" proposed in New York State would prohibit gas hookups in newly constructed buildings, if passed, electricity will be the only choice. Currently, residential electricity in New York State is the seventh most expensive in the nation, at 23.66 cents per kilowatt. It is worth noting that only 14.6% of New York State residents use electricity to heat their homes, compared to the national average of 41% in 2021. Additionally, I will use comparison models to evaluate the return on investment for residential solar panels, with the goal of determining whether this technology can save New York State residents money and provide greater financial flexibility in their monthly utility bills.

Internet Store: Time to Go for Shopping

Andriy Martynyshyn, CIS 494
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
Do you know how much of our free time we spend visiting stores? According to statistical data, it is a crazy number, which could be reduced with the help of Internet Stores, so that people will have more time to enjoy or do other things. This research project is focused on designing an Internet Store. It will consist of three parts: database, server, and client. Additionally, the project will build a web server with Node.js, NPM, and React, a JavaScript website client as well as PostgreSQL database. The server will be communicating with the database and the client, where errors and page transitions will be detected. The database will store the necessary information about user and products with its characteristics and images in the Internet store. The user or shopper will need to create an account on the website. The administrator can create different products, types, and brands in this Internet store. Node.js is selected because it is a cross-platform, open-source server environment that can run on Windows, Linux, Unix, MacOS, and more. NPM is a package manager for the JavaScript runtime environment of Node.js. React is a free and open-source front-end JavaScript library for building user interfaces. PostgreSQL, also known as Postgres, is an open-source relational database management system (RDBMS) that will be used in this project, emphasizing extensibility and SQL compliance. The outcome of this project is an active online store where one can create a shopper account, view products with their characteristics and images.

Port Is Open!

Farah Al-Karkhi, CIS 494
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
Network security is essential for any digital community as it helps to protect against cyber threats, safeguard critical infrastructure, maintain trust and credibility, as well as to educate and raise awareness about cybersecurity. The goal of this research project is to create a program that scans a network for open ports, target IP addresses, services, and potential vulnerabilities. Python programming will be used to provide a wide variety of packages for network analysis. This project will develop the ability to create a single report generated from the scanning of ports and DDOS (Distributed Denial of Service). A DDOS program sends many requests to a target server, while a port scanner tool scans a range of network ports on a remote host to determine which ports are open and accepting connections. There are few tools that will be used to set up this project, such as Nmap, Scapy, IPy, Sys, and socket library, which can be used to create a network scanner that can scan a range of ports on a given IP address, and also creating, connecting, and binding sockets for communication. Once completed, this project is expected to scan a network or a host to detect open ports that may be vulnerable to attacks. By identifying open ports, one can identify potential security weaknesses and take appropriate measures to mitigate them. This will provide practical experience in developing and implementing network security measures, critical thinking as well as problem-solving skills.

The Relationship Between Fixed Mindset and Mental Health Stigma

Connor Rohan, PSY 498: Honors Thesis II
Faculty Mentor: Professor Jill Norvilitis, Psychology
Although mental health problems are common, people who seek psychological help often face stigma and discrimination. Public mental health stigma is broadly defined as negative public attitudes toward people with mental illness. Prior literature shows that attributions, beliefs, and psychological misconceptions impact mental health stigma. Further, mental illness may be

inaccurately viewed as a fixed set of attributes or a character flaw. Growth mindset refers to an individual's implicit set of beliefs about human potential to change. There is evidence that educational interventions can promote growth mindset. It was hypothesized that growth mindset would be inversely correlated with mental health stigma. 124 undergraduates completed a Qualtrics survey including a nine-item growth mindset questionnaire was adapted from the Implicit Theories Questionnaire (Spinath et al., 2003) and the Mindset Questionnaire (Schroder, 2021), the Mental Illness Beliefs Measure (MIBM; Norman et al., 2012) and the Generalized Anxiety Stigma Scale (GASS; Griffiths et al., 2011). Participants' expectations about how others perceive mental illness were measured through the Revised Perceived Devaluation Discrimination Scale (PDDS; Brown et al., 2010). Higher fixed mindset was significantly associated with greater anxiety stigma and higher overall mental health stigma as measured by the MIBM. Growth mindset was not significantly related to perceived stigma as measured by the PDDS. Promoting growth mindset in educational settings may have an overall stigma reduction effect through mitigating misconceptions about the concrete nature of mental disorders. Positive prognostic beliefs may empower people with mental illness. A growth mindset view of mental illness acknowledges the clear evidence that psychological distress is often transient, and symptoms of mental illness are treatable.

Cultural Differences in Teachers' Perceptions of Classroom Aggression

Olivia Bell, IPDS Dominican Republic
Faculty Mentor: Professor Pamela Schuetze, Psychology
The purpose of this study was to understand the differing teacher perceptions of relational and physical aggression between geographical locations (Dominican Republic and the United States). Additionally, I am interested in how the teachers' individual cultures (individualistic or collectivistic) impact these differences. Research shows that collectivistic cultures tend to prefer indirect relational aggression because it is not as overt and prioritizes societal harmony. On the other hand, research shows that individualistic cultures tend to exhibit more direct physical aggression. This project focused on learning about how culture impacts aggression within the Dominican Republic and the United States. In order to measure this, I had teachers self-identify their individual culture, either collectivistic or individualistic, using a questionnaire. In addition, I assessed teachers' perceptions of aggression within their classroom using a questionnaire that measured levels of both physical and relational aggression. Data analyses are in the process of being conducted. These findings may help to inform peer victimization prevention programs.

Impacts of Maternal Substance Use and Perception of Infant Cries on Maternal Harsh Parenting

Olivia Bell, Psychology, **Madison Kelm**, , **Meghan Leising**, and **Rina Eiden**,
Faculty Mentor: Professor Pamela Schuetze, Psychology
The goal of this study was to associations between maternal substance use, harsh discipline and maternal perceptions of infant cry sounds. Mother-child dyads (N = 127) participating in an ongoing longitudinal study were recruited after the first trimester of pregnancy from a prenatal clinic serving predominantly low-income women with prenatal substance use (n = 94) and a non-using comparison group (n = 33). During middle childhood, mothers visited the lab where postnatal substance use patterns, parental aggression/assault, and perceptions of infant cry sounds were measured. Two composite variables were created for the perceptions of infant cry sounds: impact on maternal negative affect and aversiveness of cry. A composite for harsh parenting was created from psychological aggression and physical assault subscales. Path analysis revealed that,

controlling for maternal parity and education, higher maternal alcohol and marijuana use predicted more harsh parenting. The path from aversiveness of infant cry to maternal harsh discipline reached marginal significance such that the more aversive mothers perceived infant cries, the more frequent harsh discipline they endorsed. The path from maternal alcohol use to the impact of infant cries on maternal negative affect also reached marginal significance, such that the more alcohol mothers drank, the less impact infant cries had on negative affect. Overall, the model was a good fit to the data and explained 27.2% of the variance in harsh parenting. The implications of these findings for informing prevention and intervention efforts will be discussed.

Understanding Predictors of Recidivism in Incarcerated Individuals in Western New York

Morgan Harrington, PSY 499: Evaluating Peaceprints Data
Faculty Mentor: Professor Kimberly Kamper-DeMarco, Psychology
Incarceration can provide an opportunity for rehabilitation for many; however, it can also be a catalyst for mental health issues and subsequent reincarceration for others (Fazel et al., 2016). In 2016, the New York State (NYS) Department of Corrections and Community Supervision (DOCCS) reported that 51.9% of individuals who were previously incarcerated in a NYS facility were reincarcerated with 43.6% of those reincarcerations being due to parole violations. It is important for future studies to continue focusing on this specific population to reduce the risk of reoffending. Project Blue offers case management and programming for individuals involved in the criminal justice system in the western New York region. Project Blue collects data from their clients to keep track of demographics regarding success rate of the program as well as recidivism risk. The current study uses Project Blue's archival data to potentially connect variables such as mental health diagnoses, substance use history, and number of times incarcerated, as well as many others that may have not been previously explored. The population being looked at has a range of ages, the youngest being 18, the oldest being 84, with an average age of 36 years old. Currently, 88.9% of participants are male with 7.6% of the population being females and 3.5% not reporting a gender. Multiple races are represented with majority being African American (45.1%) and Caucasian (36.5%). Analyses will be looking at associations among the aforementioned variables and will examine what variables are important predictors of number of times incarcerated.

No More Housing for the Rest of Us

Elijah Eden, SWK 300: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
Because of the low earnings and expenditures in modern-day America, many in Buffalo are compelled to live in shelters or temporary dwellings due to a lack of housing. In the book “Broke In America" it explains this even better, talking about the median for household buying in 1970 compared to the 2000s. Leading to higher per dollar rent increases and also people of color also try to go to lower income areas and struggles to get out of it from inflation and wages too. Buffalo's poverty rate is 27.6%, compared to the US’s 14.4%. Because of recent inflation and stagnant earnings, the majority of Buffalo residents are either homeless or in poverty. Imagine the rest of America if that were only one metropolis. I willl be gathering all of this information from public government websites such as the US Census and housing breakdown sites, as well as photographing and documenting what's going on in Buffalo right now. I hope that displaying my project will help the viewer learn what we can do to alter this result, slowly but steadily, but also to educate on why we at least need more housing in our own communities since a lot of problems

might be fixed by starting with simply a roof over someone's head. In conclusion, to find the root problem of this will be hard but will educate me and you further of problems in Buffalo.

Walking the Rover

Eric Barton, CIS 494
Faculty Mentors: Professor Sarbani Banerjee, Computer Information Systems and Professor Gang Hu, Computer Information System
This research project aims to develop a more intuitive and efficient control system for the Rover. In prior research, a remote-control system with a graphical user interface has been implemented successfully. Current research will focus on implementing a laser-pointer-based control system using computer vision techniques. Specifically, the project proposes to use the OpenCV library to detect the laser point and move the Rover accordingly. A camera mounted on the Rover will be used to detect the laser-point and navigate to a given destination. The image processing pipeline involves converting the video frame to the HSV color space and applying a color filter to extract the laser-point. To reduce noise, the mask, frame, and HSV layers are compared and will look for the color filter on these video frames. The coordinates of the laser point will be saved in an array and used to create gestures such as spin or reverse. The coordinates are taken from the laser point and used to control where and how the Rover moves. Python packages such as OpenCV, Numpy, and Pyfirmata will be utilized. The proposed laser-pointer-based control system offers a more natural and streamlined interface compared to traditional controls. With the laser-point controls it resembles walking a well-trained dog on a leash. The laser-pointer-based control system serves as an introduction to controlling the Rover using computer vision, with the goal of achieving fully autonomous travel.

Get One’s Patients in a Row

Joseph Kuschke, CIS 494: UG Research in Computing
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
The medical field is an important aspect for everyone’s lives now a days. Keeping track of every individual who sees the doctor can be a daunting task for office administrators if done via pen and paper, potentially impeding operations of that organization. Thus, it is obvious to see why so many medical organizations have opted to use customized software to streamline the task for their requirements. The purpose of this project is to simulate the development of a customized system to handle this business process of a particular organization. This research project will create an application for the intended use of administrative staff in a medical office setting. These users will be enabled to enter new patients into the system, update personal information, view and update each patient’s balance due, as well as general information regarding physicians and locations in the organization. MySQL 8.0 will be used to program the database on the local machine. This will include the schema, tables, views, as well as populating the tables. Two applications will be necessary for this, MySQL 8.0 Command Line Client, as well as MySQL Workbench 8.0 CE. Python will be the programming language used in the development of the graphic user interface at the frontend of the system. The libraries involved are MySQL/Python connector version 8.0.17, as well as PySimpleGUI version 4.60.4.

Cashmere Republic: A Shopping System

Fahim Alam, CIS 494: UG Research in Computing
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
This research project will create a front-end for a shopping system with the use of the Tkinter and

Pillow module of Python programming language. The Fake Store API will be used to pull product information and display it to the user. The product information that will be retrieved from the API will be filtered and will be stored in the proper department. The user will first need to create an account using their email address. The user's information will be saved to a JSON file and a shopping cart will be created for the user. This project attempts to create a prototype of the Macy's website. It first begins by converting the usable Java code to Python. After that a flowchart will be created for the program so that it can be visualized in a better way. Then different functions will be created for each step in the flowchart. The user will be able to navigate through the different departments and add or remove items to their shopping cart. At checkout the user can view the total balance and purchase the products they like. If the item is out of stock the user will receive a message saying, "item you selected is out of stock". The final outcome of this research project will be a graphic user interface that can be used for shopping at the store called Cashmere Republic.

Women Awake! American Women and Propaganda in WWI

Jaylyn Zimmer, HIS 356: World War I
Faculty Mentor: Professor Andrew Nicholls, History and Social Studies Education
Propaganda pieces were plastered everywhere from 1914 through 1918, enticing citizens to become active members of their community and to benefit their country. With men leaving to fight in Europe, it was a woman's job to keep the country running. This research paper explores the effects that propaganda had on women, and how it benefited the war cause. Before the war, if a woman were to have worked, she most likely would work in a textile factory, with nowhere near the same responsibilities or benefits as a man. With America's entrance to the war, not only did women fill in with preexisting jobs, but also began working in many wartime jobs such as telegraphers, phone operators, railroad operators, and numerous government positions. At times, women would even go overseas to serve their time in Europe. The method used for this research began with the question, "What did the women do?" From there, by analyzing propaganda posters you begin to see how they were shaped, and who they were targeted. These propaganda posters outline the role and importance of women during wartime, whether it's through recruitment or their portrayal. Using women in propaganda, and their ultimate involvement helped prove that women's involvement in the war effort, both at home and overseas, was vital to the success of not only America but the Allied Forces as a whole.

A Successful Buffalo Sports Team: An Oxymoron and Truth

Daniel May, COM 495: Directed Sports Research
Faculty Mentor: Professor Joseph Marren, Communication
Thousands of immigrants called Buffalo, NY, home in the Nineteenth Century, thus coining the nickname "the city of good neighbors." Many of these immigrants came off the boat in search of a life better than the one they left in their homeland. For some, this search proved to be fruitful. For others, not so much. For a handful of young, German men their search struck gold. In 1895, Fred Burkhardt, physical director of the once prominent boys' department of the German YMCA on the corner of Genesee and Davis streets, put together a youth basketball team of rag-tag German boys from the surrounding neighborhoods. Showing immediate promise in their inaugural 1895 season, the young men would quickly rise through the ranks of various leagues, ultimately becoming Buffalo's most successful sports team. Through their 30-year existence four of the original nine men stayed with the team, helping accumulate over four championship titles including the 1901

Pan-American Exposition basketball championship and the 1904 St. Louis Olympics basketball title. With a storied history, yet no tangible storybook to tell it, I interviewed family members of former players and conducted primary source research in newspaper archives to compile an enticing, yet true, historical overview of the team. My findings yielded an impressive truth about the team: Despite facing extreme financial challenges and xenophobic opponents on and off the court, the "Buffalo Germans" accumulated an impressive 744-82 record, putting together Buffalo's greatest sports story to have never been told.

Sexism in Women's Wages

Allison Morey, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and sexism in women's work look like in Buffalo, NY? For years women have had to fight to be able to work. They have had to fight for safe work environments. Currently, the main fight is for equal pay. I experience the wage gap at my job. I believe that if someone can do the same job as another person, they should receive equal pay no matter their gender. In "Broke in America", it is stated that women are 36% more likely to be in poverty. Women in society have been stereotyped to specific jobs while still not getting paid a living wage. Throughout this poster, you will be given data from the time that book was written, to today's time in Buffalo, NY. In this poster I will show through local photos using PhotoVoice about how wages have an effect on women in the Buffalo area. PhotoVoice is an online site that is used to help social changes. My goal for this project is to bring awareness. I want to show everyone that women deserve to get paid just as much as men, for doing the same job. I would like to get more people involved with advocating for women's right to equal pay and show else you can show your support to this fight.

Poverty and Racism: The Downfall of Buffalo

Briasia Wilson, SWK 300: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and race look like in Buffalo, NY? For many years in Buffalo redlining has always been a huge thing. Throughout Buffalo you can visibly see the segregation that is taking place throughout different neighborhoods. the poverty rate for African Americans in Buffalo is 32.3%, while 9.3% of white people are in poverty. For this research project, I will be using Photovoice to capture photos for my research question. I will collect photos of 2 neighborhoods, one towards the east side of Buffalo and the other will be south. This will show that there is a big difference in the environment depending on what side of town you're at in this region. The east side of Buffalo is majority black and poor, there's most likely abandoned property, homelessness, violence, and more. In contrast, when I go to the south side of Buffalo, there would most likely be presentable buildings, less violence, less homeless people on the streets, and predominantly white people. I am aiming to inform my audience on the ongoing racism and segregation of Buffalo, NY by visibly showing it. I hope to show everyone that poverty doesn't always mean that people are being lazy or just want everything handed to them, redlining has been a major issue for centuries that constantly set minorities back to keep them from progressing. I would love to spread awareness so that people can become more educated on the deeper levels of race and poverty and not just the surface level.

Poverty and Housing: Why Can't I Afford a Simple Home?

Dalton Demblewski,
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and housing look like in Buffalo? In order to fully understand what this looks likes in a single city like Buffalo, we need to look at poverty and housing as a whole across the United States. Across the nation, housing is relatively expensive, and people are sometimes forced to choose between paying rent for shelter or paying for food and necessitates because they can't afford both. Homelessness has been found to be rooted from unaffordable housing, low wages, and discrimination against people of color. Unfortunately, the United States is doing little to nothing to combat poverty regarding housing as the only substantial program they have in place deducts mortgage interests but only seems to benefit the rich people who can actually afford housing. Photovoice is a community based participatory research method that will be used to collect information on the selected community of housing. Photos of poverty in regard to housing will be taken around the city of Buffalo to show the true experiences of homelessness. I expect Buffalo to have medium to mild rates of poverty in regard to housing. I also expect to find that the pictures taken will resemble and show the information that is known nationwide. This project aims to show what poverty and housing truly look like in Buffalo. My intention of this project is to show my community the poverty and housing problems in Buffalo and hope to spread awareness along with giving information on how to help this ongoing problem.

Helping Hygienics: Advocating for Hygiene Essentials

Eden Harrison, Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What do poverty and hygiene look like in Buffalo? Hygiene includes diapers, feminine hygiene products (tampons/pads), access to public toilets, access to showers, clean clothes, and basic soap and water. The lack of most of these essential items can lead to Hepatitis A outbreaks which are spread through the ingestion of fecal matter. The Centers for Disease Control received more than 2,500 reports of hepatitis A nationally. The majority of people with diagnosed cases report homelessness, drug use, or both. The cheapest form of Hepatitis A prevention is soap and water. Collecting data by Photovoice, Photovoice is a method that uses photography to demonstrate societal issues. I have taken photographs from our city of Buffalo and used local data along with chapter 7 from "Hygiene: A problem Swept under the rug "from Broke in America by Joanna Samuel Goldblum and Colleen Shaddox. I want to demonstrate the lack of Hygiene systems and the lack of products that are unavailable and inconvenient to not just people in poverty but to all Buffalonians. Clean people are not only healthier; they are more likely to attend school and work, which produces higher skills and wages. I expect to find evidence that shows the correlation between not being clean and climbing out of poverty. By the end of this presentation, I hope to have people recognize the lack of basic hygiene products in everyday life and bring people aware of what this lack of hygiene can do to one's community.

Mental Health: A Conversation About Poverty

Alexis Creasey, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What do poverty and mental health look like in Buffalo? Poverty and mental health go hand in hand, despite the arguments from those who judge the man on the corner asking for money. Some people in America deal with a daily choice of "this or that", and the stress of that choice plays on the mind all day, "Did we make the right choice?". For those living in poverty, there are limited resources and assistance pertaining to mental health care and this too would add to the list of "this or that" choices made daily. The cognition work, the "bandwidth", used to make these decisions is

taxing on the brain, leading to mental health issues that, because of poverty, go untreated. Using Photovoice, I can research using pictures, and then use those pictures to answer my research question. Taking pictures of downtown Buffalo, I believe will open the eyes of those who say poverty is the fault of the beholder, “work harder”. I expect to find that although Buffalo suffers from poverty, they also, as a community, suffer from mental health. This project aims to open eyes as it pertains to poverty causing trauma, it also aims to lessen the amount of responsibility and fault towards the one in poverty and instead pushes it on government policies. My intention with this project is to promote compassion, it is to promote awareness and it is to promote having conversations about change.

E-Motion: Exploration of Movement & Identity on Film

Olivia Gianadda, FAR 420: Advanced Photography
Faculty Mentor: Professor Yola Monakhov Stockton, Arts and Design
In my project I studied studio portraiture, more specifically motion blur, in which I captured on medium format film and printed with silver gelatin printing process. My goal of this project is to create dark room prints & a college photo book which will be inkjet printed in multiple editions and hand bound. My project integrates digital and analogical processes to create colleges using public domain imagery. The process includes scouting for models that are visibly queer & confident, directing, posing & styling them. It also includes setting the lighting in the studio, which I drew inspiration from the painting technique tenebrism, referred to as dark & moody. The medium format allows for a square aspect ratio, which I find beautiful for portraiture in my project. The film process includes exposure, film development & dark room printing. I am printing on 16”x 20” large format paper and scanning in for a high resolution. In the college process, public domain images will offer symbolism & texture that differs from my own style but enhances the work thematically as a whole.

Virtual Reality Maze

Anthony Turello, CIS 494
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
This project is the creation of a Virtual Reality video game. The player needs to navigate through a maze to find a chest containing a key which will allow them to unlock the door at the exit. The game would not be as fun without any obstacles. Along the way players will face challenges like repeating tunnels and mimicking creatures. These obstacles will not pose a serious threat to the player since there is no combat mechanic; they simply need to push through and keep looking for the key or the exit. This game project will run on VRChat. It is an online virtual world platform that allows users to interact with others with user-created 3D avatars and worlds. VRChat released a virtual reality game that is defined as a social platform that users can engage with others on a more personal level than in most games. It also allows users to control virtual avatars that they can either find within the game or create themselves. The creation aspect does not only span to avatars, but players can also create worlds within the game. Using a modified coding language called C# (C Sharp), worlds like the one in this project can be created. The project will be developed with assistance of open-source tools like Blender, which is a 3D design software as well as Unity, which is a powerful game engine used by most games developers today.

Research Aspect of COSMOS III

Makaih Rivas, ENT 466: Electrical Design II
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Professor Stephanie Goldberg, Engineering Technology

DC motor control is a critical aspect of many industrial and automation systems. The ability to precisely control the speed, torque, and direction of a DC motor is essential for a wide range of applications, from robotics and manufacturing to automotive and aerospace systems. DC motors are widely used due to their high efficiency, reliability, and ease of control. However, controlling a DC motor can be complex, as it requires precise control of the voltage, current, and position of the rotor. In recent years, advances in power electronics, microprocessors, and control algorithms have led to significant improvements in DC motor control systems. Various control techniques such as PID control, fuzzy logic control, and model predictive control have been used to improve the performance of DC motor control systems. Moreover, the development of digital signal processing and field-programmable gate array (FPGA) technology has enabled the implementation of sophisticated control algorithms in real time. This literary paper/presentation provides an overview of DC motor control, including the principles of operation, different types of DC motors, and various control techniques. The advantages and limitations of different control strategies are discussed, along with the factors that affect the performance of DC motor control systems. Finally, recent developments in DC motor control systems are presented, highlighting the challenges and future directions for research in this field.

Different Control Strategies for Variable Frequency Drives

Joshua Van Lew, Electrical Engineering Technology, Smart Grid
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Professor Stephanie Goldberg, Engineering Technology
This research project deals with scholarly literature reviews of different control strategies for variable frequency drives (VFD). The goal is to select state-of the art scholarly papers describing various control methods and how they influence VFD performance. Currently I am familiar with four control strategies, such as voltage-frequency control without an encoder, with an encoder, closed-loop vector control, and open-loop vector control. In-depth investigation of these methods as well as other methods involving artificial intelligence (AI) and machine learning (ML), will allow to identify optimal control strategies for VFD and make recommendations for users how to select most appropriate control technique for their specific applications.

Application of Cyber Physical Systems in Automation Control

Gedion Melesse, Electrical Engineering Technology
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Professor Stephanie Goldberg, Engineering Technology
The 4th industrial revolution, also known as Industrie 4.0, is being promoted by the newly emerging research in the field of cyber physical manufacturing systems, which integrates computer science with manufacturing science and technology. Cyber-Physical Systems (CPS) generally focuses on the integration of the physical world with cyberspace. It is the incorporation of physical components with data acquisition, control, and communication in an automation environment. At present time, CPS is the point of interest for numerous academia, governmental and industrial sectors. Empowered by the recent development in the Internet of Things and cloud computing technologies, CPS are evolving as a major contributor during and post the product manufacturing process. Cyber products now have a virtual space in addition to their real physical space. A product's virtual space is a digital duplicate that is connected to it so that manufacturers and their consumers may better manufacture, supervise, maintain, and utilize it over the course of its life cycles. Although the

development of production technologies and CPS has undoubtedly benefited manufacturers, they have also had to address the risks that these interconnected systems pose to their operations. The manufacturing industry as a whole is well aware of this threat, and many manufacturers claim that cyber security is an essential part of their automated operations. This research project seeks to provide the findings from studies on the use of cyber physical systems in automation and the creation of such systems for intelligent manufacturing. The ever-growing need for implementation of cybersecurity and other protective systems will also be discussed. The cyber physical systems architecture and its application in manufacturing will also be explored in this project. This project will also emphasize the importance of cloud computing and the Internet of Things in industrial manufacturing and factory automation. The final product will consist of a paper and brief powerpoint presentation. The findings of the research will be thoroughly discussed in the paper and the presentation will briefly cover the results.

College Connect App

Khallid Barber, CIS
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
College Connects is a mobile application that connects users with local service providers, who are mostly college students, for lawn care and snow shoveling. Users can input their address, zip code and the date of service. The app will provide a list of local service providers. Once the user selects a provider, the app will give them a quote based on the service needs. By using College Connects App, users can save time and money in searching for service providers and can rest assured that they will be getting quality service. The main goal is to develop an App compatible on both Android and iOS smartphones so that clients can easily upload required information and get same day quotes for their service. This App will be designed and debugged using Flutter open-source UI. Flutter is a mobile application development framework developed by Google that allows developers to build high-performance, visually appealing, and feature-rich mobile applications for multiple platforms using a single codebase. Flutter uses the Dart programming language, which is designed for cross-platform development and enables developers to write code that can be compiled to native machine code for multiple platforms. The Dart language is well-suited for building scalable and flexible applications with features that make it easy to work with asynchronous code. Overall, Dart and Flutter provide an efficient and powerful solution for building cross-platform mobile applications.

Predicting Student Dropout: Analysis of Big Data

Mukhtar Mabruk, CIS
Faculty Mentor: Professor Sarbani Banerjee, Computer Information Systems
This research project aims to develop a predictive model that can accurately identify students who are at risk of dropping out of school and those who are likely to succeed academically based on their demographic, academic, socio-economic characteristics, and other related data. This data analysis project can help educators and policymakers to intervene early and implement targeted interventions to prevent student dropout and promote academic success. Predicting student dropout and academic success is a critical challenge for educational institutions. It allows them to identify students who are at risk of dropping out and provide targeted support to help them succeed academically. Additionally, predicting academic success can help institutions allocate resources more effectively and improve overall student outcomes. The programming languages that will be used for this project are Python and R. It will also use the most popular data analytics packages such as Pandas, and NumPy. For the Integrated Development Environment (IDEs) Jupyter Notebook and Spyder will be used for development. Hardware requirements will depend on

the size of the dataset and the complexity of the algorithm used. The result of this project will help identify which students are at risk of dropping out of school and what are the reasons or factors behind it.

The Relationship Between Adverse Childhood Experiences and Moral Development

Adrianus Wutz, Psychology, **Lindsay Prout**, Psychology, **Xiamara Brooks**, Psychology and **Ashlynd Cox**, Psychology
Faculty Mentors: Professor Naomi McKay, Psychology and Professor Kimberly Kamper-DeMarco, Psychology
Past research has found that childhood maltreatment is correlated with a predisposition to utilitarian decision-making (i.e., making decisions for the greater good of society). In a sample of childhood sexual abuse victims, participants were more likely to report higher levels of disapproval of atypical moral norms, which tends to lead to more utilitarian decision-making. It is also found that women with PTSD were shown to have changes in moral reasoning, particularly a reduction of selflessness. However, there is a lack of research examining how childhood maltreatment relates to an individual's moral decision-making skills. That is why the current research study assesses the relationship between adverse childhood experiences and moral decision-making in college students. It was hypothesized that those who score high in adverse childhood experiences would respond in a way that exhibits more utilitarian decision-making than those who score low. Approximately 150 participants aged 18 to 30 years old from Buffalo State University will be included in this study. An online questionnaire is being used to assess demographics, moral decision-making, and adverse childhood experiences. Participants will complete the Adverse Childhood Experiences questionnaire and respond to ten moral dilemmas. It is expected that there will be a positive relationship between adverse childhood experiences and utilitarian decision-making. This study can further contribute to research on the effects of adverse childhood experiences on morality development.

The Moderating Role of Entrapment & Hope on the Relationship Between Risk Management & Suicide Ideation.

Adrianus Wutz, PSY 496/498
Faculty Mentor: Professor Dwight Hennessy, Psychology
A variety of variables can predict suicide ideation. Risk management is a variable that lacks much research regarding suicide ideation, even though risk-taking behavior is a strong predictor of suicide ideation. That is why the current study attempted to examine risk management's role regarding suicide ideation using hierarchical multiple regression. The central hypothesis of the present study investigated the moderating roles of entrapment and hopefulness in the relationship between risk management and suicide ideation. These moderating factors are predicted to independently interact with an individual's risk management levels when predicting suicide ideation. In addition, the current study developed a new scale to examine an individual's risk perception relating to the public, family, acquaintance, and suicide situation. Participants were recruited from Buffalo State, with an additional thirteen from outside the university. Participants were asked to answer a questionnaire assessing their risk management, suicide ideation, entrapment, and hopefulness levels. Furthermore, participants completed a scale relating to their public, family, acquaintance, and suicide situation. When testing the central hypothesis, analyses found little

statistical significance. Only the main effect of Entrapment predicted the frequency of suicide ideation. When analyzing the new scale, all four subcategories were confirmed in a factor analysis. Unfortunately, the new scale did not predict suicide ideation. The main conclusion of these findings is that entrapment is a strong predictor of the frequency of suicide ideation. More research is needed to understand the potential role of risk management in suicide ideation.

Poverty and Mental Health Don't Mix Well

Terri-Jamel Curry, SWK 300: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
How do you think one's mental health has affected their entire life? Poor mental health, unfortunately, is the most common thing among those in poverty. Low-wage jobs, having a low income while still having to take care of families, personal wages, and other things life throws, while still having to monthly finance rent; a continuous cycle of these constant stresses can burden an individual. Finding access and the proper resources to the right mental health care can also be a struggle within itself when living in poverty, however, it's strongly encouraged. While in Buffalo, the area, 'Black Rock' has inspired the photo voice presented. The information collected was through just being there to experience the environment of Black Rock. What is expected of this assignment once finished is to truly experience what poverty is like, how is it formed and normalized in today's society, and truly understand the complexities of poverty, those in poverty, and how these things can affect someone's mental health, and sometimes for the worst in many cases, unfortunately. To conclude, mental health is not something to be fantasized, about or wanted, and it is a sad thing that many fight daily to come out of or find help for. The hope for this project when displayed is such a deeper want of understanding, and empathy towards those who have to endure this unfortunate lifestyle. A deeper understanding allows a sense of connection, and connections can change lives forever.

Buffalo's Filthy Problem: Hygiene

Khadara Wright, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
In Buffalo Poverty Varies, But What Does That Look Like Relating to Hygiene? The Problem Swept Under the Rug? Rarely thought about when not relating to oneself, hygiene is important and can be difficult to maintain. Chapter seven of Broke in America discusses how hygiene determines more aspects of our lives than we think; being dirty is unacceptable in society, if you look the part, you'll suffer the consequences. The stereotypes attached to being dirty are now attached to you. The chapter speaks on how lack of access to hygiene affects poverty in three ways. The first is health, followed by barriers, and the third results in shame. It is easier to get sick when you aren't clean, it's why we wash our hands before cooking and after using the restroom. When sick it's important to isolate to protect others. But staying home means missing out on education or work. Both result in allowing you to become successful and taking that away now temporarily stops one from escaping poverty. When you aren't your cleanest or perhaps may smell this creates a barrier between you, your peers, and activities. It's hard to want to take part in anything if you're extremely self-conscious which leads to the third point, shame. People are constantly being judged and shamed. This prevents others from socializing and even doing small things for themselves which might not involve a lot of people. With PhotoVoice and local data, I'll capture how limited individuals become when hygiene isn't sustainable.

Transportation: Not for Travelling Americans

Jordan Nass-deMause, SWK 300: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and transportation look like in Buffalo? Transit systems constantly have holes missing in certain communities. This neglect of communities can be detrimental as they must rely on and be able to afford private transportation. But being forced to use a car, ride sharing app and other more expensive modes of transit can cause most people not to be able to work in certain places as their paychecks maybe paying off their transit to get to work and back mostly. To convey this point, I will be using photovoice to capture these neglected communities compared to those areas not being neglected. Photovoice is a method that combines photography and data collection in a way that can show others outside of the community's current situation. In this case I will be informing people of East Buffalo's lack of transportation and how past transportation proposals brought forth may solve this issue of poverty. These members of the community are dealing with a system that is failing them whether it is tax paid funding not being allocated to prioritize transit or the housing system itself purposefully failing them with systems like red lining being decided based on transit systems. The lack of advocacy around this problem also affects this, but hopefully research like this will help band together more awareness for these neglected communities and rejected proposals. With that maybe one day Buffalo will support all its taxpayers with the public transport they need.

Starting the Race a Mile Back

Gillian Scozzaro, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and education look like in Buffalo? I use data to support my project with information from "Broke in America" by Colleen Shaddox and Joanne Samuel Goldblum. They explain that public education's funding and the quality of education that students receive is affected by the wealth of the community the school is located in. This is because municipal property taxes fund and support public schools. Another platform where I found qualitative research methodology is PhotoVoice, designed for people to share and collaborate through taking photographs. Both PhotoVoice and my purpose is to encourage awareness and social change. I took my own photos of schools, colleges, and universities from the greater Buffalo area. I expect a connection between education and poverty to be shown by the lack of maintenance and funding for some schools and communities, while also focusing on how other schools within Western New York possess the opposite. Coupling PhotoVoice with national data from "Broke in America" will help me show that there is disproportionate funding in education between communities, giving some students a head start, while hindering others. I hope this project will raise awareness and create discussion especially within the Buffalo State College community as well as over social media, reaching school districts in wealthier, higher funded communities. Hopefully seeing the disproportionate opportunity and accessibility of other education systems will encourage more involvement in Parent Teacher Association meetings and town meetings.

Poverty in Buffalo Public Schools

Andrew Laughlin, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What do poverty in schools and the education system in Buffalo look like? Throughout the United States, public schools and public-school systems are severely underfunded. This makes it more difficult for people to get a decent or adequate education to be able to get out of poverty. With the low funding to our public schools, it makes it not just hard on the students but also hard on the teachers and staff members for trying to teach the kids and educate them to meet the standards

required for their futures. I will be doing my research using the PhotoVoice method and will be conducting my research in the city of Buffalo, New York. The photos taken will come from the schools of the Buffalo Public School system, both photos from the inside and outside. I expect to find the technology in the schools themselves would not be up to date with properly funded schools or the private schools, even those private schools that are also located in and around the city of Buffalo. In my research, I also expect to see that public schools will have a larger student to teacher ratio than the ratio in a private school. In the end my research will show the severe underfunding that the Buffalo Public Schools face.

Please Don't Shut Off Our Electricity: Facing Utility Issues in Buffalo

Elizabeth Denis-Torres, Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What do poverty and power shut-offs look like in Buffalo? I chose to read chapter 5 of “Broke in America” titled “Power Shut Off” and this chapter opened my eyes to the utility issue there is in the country of America, especially how those in poverty struggle with it most. Those in poverty already struggle to pay their bills, but households that are expected to pay their electric bill are often behind on other bills because of it. Low-income households pay 7.2% for energy which is 3x more than wealthy households. PhotoVoice is a research method that combines photography and critical discussion that allows for those that are affected by a particular issue to engage with each other and inform social action and change. Buffalo is the community in which I will be researching, and I will be using PhotoVoice as my method to conduct research and take pictures of Buffalo. My intention with this research project is to show people in this very community how others around them may be affected by power shut-offs, and how close poverty really is to us daily. I hope with this project I am able to invoke change in how National Grid goes about shutting off people’s electricity, and how we as a community can do things differently to not be affected by so many power shut-offs.

Correlates of Cannabis Use and Self-Control Across a Diverse Sample of College Students: 2020-2022

Francesca Giaquinto, Psychology
Faculty Mentors: Professor Kimberly Kamper-DeMarco, Psychology, Professor Jessica Braymiller-Knapp, Public Health and Professor Jessica Kulak, Health, Nutrition & Dietetics
Despite the established relationship between substance use and self-control, it is not known how the COVID-19 pandemic has impacted this association. Given the unique circumstances of the pandemic along with changing societal regulations in cannabis use, and their collective impact on college students, there is a need to examine the relationship between cannabis and self-control during the pandemic era. Data was collected from a serial cross-sectional sample of college students at an urban U.S. institution during 2020-2022. Two-way ANCOVAs examined differences in past 30-day cannabis use by self-control and cohort. Post-hoc analyses examined the association between self-control and the typical number of times individuals engaged in cannabis use on days when any cannabis use was reported. Self-control was significantly lower for past 30-day cannabis users (compared to non past 30-day users). Self-control significantly predicted 30-day cannabis use such that those individuals with low self-control used cannabis on significantly more days (~11 days) than those with average (~5 days) to high (~3 days) self-control. Finally, there was a significant correlation between frequency of use and self-control ($r = -0.28$, $p = .04$) wherein those with poorer self-control used more times per day on cannabis-using days. Despite evolving

state-level legislation regarding both medicinal and recreational use, college campuses often maintain drug-free campus policies, inclusive of cannabis. This mixed and evolving legal landscape poses challenges to college administrators, whose goal is to promote the health and academic success of college students. Implications for college students navigating COVID-era learning and social environments, and the related role of self-control, are discussed considering these findings.

Canned Tuna Advertising History in the Twentieth Century United States

Jonathan Prell, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This paper reviews the history of advertising of canned tuna in the twentieth century, with a specific focus into the United States' consumer markets. To achieve this goal of investigating canned tuna's advertising history, applicable information from primary and secondary sources was extracted for the use of explaining the background of the topic. Throughout the twentieth century, canned tuna grew as a consumer industry, and certain practices were used to advertise to the mass market. These sellers of canned tuna used specific procedures when trying to move their product into the cupboards of American consumers, and this paper will cover the history of this industry's practices in advertisement. One of the more common advertising strategies used by canned tuna sellers was to use women in their visual advertisements, mostly due to them identifying the majority of their consumers as housewives. This would be a trend that follows through many of the canned tuna advertisements in this time period, and many of their advertising methods were related to attracting the attention of housewives. Another example that drives this major point home is the inclusion of recipe ideas in advertisements. This was a way for advertisers to give housewife consumers the feeling that, when they made a homemade dish from canned tuna, they were doing the "proper work of a housewife". This presentation will be in the form of a poster that goes over examples of canned tuna advertising. It will show how food advertising can target groups of consumers.

John Williams and His Film Score for Schindler's List

Sebastiano Lombardo, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Schindler's List (1993) tells the story of Oskar Schindler, who saved nearly 1200 Jews from perishing in the Holocaust. By hiring the Jews as workers for his munitions factories, he removed them from the Nazi's grasp. Though the historical narrative brings out many powerful emotions, it is the artful cinematic execution on the part of both Steven Spielberg (b. 1946) and John Williams (b. 1932) that brings this film--which proved almost impossible to complete--to wide acclaim and many international awards, including the Oscars. While Schindler's List represented Williams' fifth Oscar, it was arguably the culmination of his film career. Its music is essential as an expressive foundation on which the acting and filmography can shine. In particular, virtuoso violinist Itzhak Perlman's (b. 1945) performance of the main theme brings a heartbreaking musical solo into our hearts. Williams' early life had him originally wanting to become a concert pianist. But the seeds were already present for his alternative career in film scoring. Movies like Jaws (1975) and Star Wars (1977) would bring back the classic Hollywood symphonic film score that had become a lost art in the industry. The style combined Baroque-era techniques like theme and variations with subsequent influences, including elements of the Classical era's sonata-allegro form. These techniques would serve Williams well in Schindler's non-diegetic scenes, where the music is expressly designed for the audience's perspective. And though sparsely scored by today's modern cinematic standards, I

believe this quality allows Schindler's music to strike a balance with the technical components to illuminate a searing and captivating story.

Poverty and Hunger in Buffalo

Ryan Gallant, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and Hunger look like in buffalo? A major problem we choose to ignore, we as people of the community and people of our own have to at least help out and give back to the community in different ways. I don't have everything in the world I want and I'm also not rich but there are people who go through the worst things every day, and I just have to say I am blessed, and we should all be thankful. The government does not do a lot for the people who are struggling in different aspects. They should provide social welfare as I also stated before because I know we have a lot of charities in this world but not everyone is going to donate to the cause. The government could at least fund something towards the cause. Charities depend on people to send them money, it's not guaranteed. For my topic I will be using data from the area/community, the income, history, crime rate, poverty level and hunger statistics. I feel like my topic is sort of related to homelessness in a way that people are in need and it's similar because that's something that's important and we need to touch on. My intention of doing this project is to bring awareness to the people around and those who are in the community to help people in need and make a change for the better, it's not just adults that are going through it, it's everyone the children as well.

Struggles of Housing in Brooklyn

Rebecca Laurent, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What do poverty and housing look like in Brooklyn? “Broke In America” explains that due to decades of stagnant income growth and rising housing expenses, US citizens are finding it difficult to maintain their current standard of living. According to HUD, there are more than 500,000 homeless people in the United States, although, for the most part, homelessness is more of a mathematical issue than a complex social one. Rent and sale costs are higher in desirable neighborhoods with greater employment opportunities, reputable schools, and other lifestyle advantages. The United States is doing essentially nothing to improve the issue as a whole. Brooklyn will be the community I take photos of to depict experiences of poverty, and PhotoVoice was the tool I use to get my data. According to studies, a number of variables, including mental illness, unemployment rates, and poverty, have an impact on homelessness. Three of the top ten neighborhoods in the city where family homelessness is most prevalent are located in Brooklyn. These neighborhoods include Brownsville and East New York. I hope to raise awareness in the community about the struggles of homelessness, shelters, and housing that people face and the factors that contribute to it. As more people become aware of this problem, hopefully, they find more solutions to help solve and stop the percentage of homelessness.

What Does It Mean to Be Clean? Hygiene

Imani Marino, Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
Nearly a third of residents across the Buffalo and Niagara region live in poverty. Living in poverty succumbs them to a lack of resources, more specifically for their hygiene. Individuals don’t have access to clean wardrobes or clean bathrooms. On a global level there is a lack of toiletries and access to clean water for showers or to brush teeth; going as far as not even having enough to

afford cleaning clothes at the laundromat. I will be using photovoice for my research where I will be using photographs from within the community, which allow for guided interviews and exploring reasoning and emotions. I feel my photos will connect to the 'Broke in America' because the literature describes my community of Buffalo perfectly. I plan to go into my community and ask individuals about their experience with the lack of hygiene positivity in the community in hopes to find it is better than what is expected. Hoping for the best. With my research project, I hope to bring awareness to the things we might take for granted sometimes. I want people to become aware of the hygiene issue many communities are facing today, to bring a community together, and give back where we can. The more we know allows us to help in the best way we can.

Poverty is Trauma is Discrimination: Mental Illness in African American Community

Monica Michaux, Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
How does mental illness link to poverty in Buffalo? My research topic is the African American community in poverty due to mental illness. Mental illness is a common health condition in the United States, affecting one in five Americans. The stigma associated with mental disorders can even worsen a person's mental health. In chapter 12 of "Broke in America", we see that the brain's development changes each day. There is growing evidence that racism is a serious threat to public health that places communities of color at higher risk for poor health outcomes. Photovoice is the method used to collect this data by taking pictures of African American communities. Photovoice is an established method developed initially by health promotion researchers. Results of the investigation will be presented as it relates to how the African American Communities are at higher risk for poor health outcomes due to poverty. Buffalo has a poverty rate of 27.6%. In Buffalo, New York. My intention for the project is to raise awareness of mental illness in the African American community and how it plays a part in poverty.

Poverty, Trauma, and Mental Health Discrimination

Shanaia Panchoo, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and mental health discrimination look like in Buffalo? Poverty and mental health share an interacting relationship that negatively impact the Buffalo community on multiple levels. Poverty and mental health go hand in hand because people can be pushed into poverty. Being pushed into poverty can also lead to substance abuse. Financial stress causes a decrease of cognitive performance and intensifies stress. Children would become at risk because they don't get the help they need. Children and adolescents from low-income families had greater rates of depression and anxiety. Poverty has an impact on mental health through a variety of social and biological factors that operate at several levels, including individuals, families, local communities, and nations. For the community, I decided to use Photovoice and local data from Central Buffalo. Elmwood shows the West Side of Buffalo, yet I will focus on the northern boundary of the neighborhood. Elmwood Village is where I expect poverty to portray at a high rate compared to the East Side. The foreign-born population has increased in Buffalo by 95 percent since 2013. It is known that most immigrants and refugees move to the West Side of Buffalo to start a better life. As an immigrant and/or refugee it is hard to adjust to a new environment in poverty with no assistants. My hope for this project is to raise awareness of mental health discrimination and start programs to provide better help for communities in poverty.

Poverty and Hygiene: How This Affects a Community

Delaney Reid, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and hygiene look like in Buffalo? Access to hygiene products such as tampons, diapers, soap and clean water, even showers has been a problem all over the United States. One example is in 2017, a hepatitis A outbreak occurred in California, and this was due to the belief that homeless and underprivileged people were unable to access soap and water. When the means to hygiene were provided to those who were unable to access it, spread of disease decreased, attendance in schools rose, and overall morale was boosted in the affected areas. The method I will be using to collect my data is Photovoice, a research method that involves taking pictures. The community I will be taking pictures of is Buffalo, NY. Poverty is extremely prevalent in Buffalo, so I will not be surprised to find a lack of hygiene products as well as facilities. My intentions for this project is to shed light on the fact that hygiene is a basic human right that we should all be able to afford. I hope it will encourage people to be mindful of this underrecognized issue and donate to banks and homeless shelters so that people affected by this epidemic will no longer have to worry about accessing the right to hygiene through menstrual products, diapers, soap and toothpaste, and so much more. The more people are aware of the lack of access to hygiene, hopefully the spark to change will occur.

An Integrated Assessment of Next Generation Photovoltaic Technologies

Joseph Wikar, Mechanical Engineering Technology, **Nicholas White**, Mechanical Engineering Technology, **Leanna Tse**, Electrical Engineering Technology, **Michael Vullo**, Chemistry and **Tyler Body**, Mathematics
Faculty Mentor: Professor Saquib Ahmed, Engineering Technology
With the tremendous impact of the world of "nano" already in flux and with much more to occur in the present decade, it is imperative that a holistic approach be taken to tackle this disruptive space–in understanding not only the science and engineering of a given technology, but assessing the economic viability of such a technology, and judging the ethical, legal, and social implications of it as well. Lastly, with the incredible development of data science techniques over the past decade, it is time to take full advantage of them in the space of accelerated discovery. In this project, we are showing a critical assessment of next-gen solar technologies beyond the current standard of crystalline Silicon. Each technology is assessed through the lens of scientific and engineering metrics (device and module efficiency, stability, degradability), economic viability metrics (such as $/Watt and Levelized Cost of Efficiency), and lastly, through the lens of ELSI (ethical, legal and social implications).

Mental Health Discrimination and Poverty in Buffalo

Farhio Abshir, SWK 301: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What does poverty and mental health discrimination look like in Buffalo? Throughout the country, mental illness is more common among people with economic hardship. Some people are at economic risk as a result of their psychiatric diagnosis because it can interfere with careers and relationships. On other hand, poverty itself is so stressful that it can harm mental health. I use photovoice, a research method used in the community to gather information about what it looks like mental health discrimination in buffalo, so that can help me answer my questions about the

research. I was able to collect some photos of mental health discrimination areas in buffalo, one example of photovoice I use is Buffalo Psychiatric Center, and their primary mission is to serve various individuals with serious mental illness and mental diagnosis by developing healthy lifestyles through exercise, nutrition, disease prevention and work towards recovery through self-help and empowerment. 85% of people who must deal with mental health conditions report experiencing discrimination in various aspects of their lives, including employment, education, and social relationships. Mental health discrimination refers to unfair treatment or prejudice against individuals with mental health conditions. I hope to raise awareness in the community about mental health discrimination by educating the public about mental health conditions and engaging in advocacy efforts that can help promote change and raise awareness in the community. We can create a more inclusive and accepting community for people with mental health conditions, and understanding the topic will help society to acknowledge these conditions.

World Hunger: Optimization of Transportation Costs

Lance Swiatek, AMT 495: Applied Mathematics Project
Faculty Mentor: Professor Hongliang Xu, Mathematics
World Hunger affects hundreds of millions of people worldwide, this problem is one of the United Nations Sustainable Development Goals and working towards a solution would not only better the lives of those in need of food and/or better nutrition, but it would allow groups such as the UN to work on other important goals. World Hunger has been an ongoing problem yet to be solved with many factors, including transportation costs and methods, number of warehouses and locations, and supply and demand between countries. Although there are many more factors to this problem, this project considers those factors stated earlier to establish various models that minimize transportation costs, using the Simplex method and specialized algorithms for the transportation problem. This project considers a predetermined number of countries in need and donor countries, uses historic data from various national/international organizations, such as the United Nations, to determine the demand and supply constraints, and examine the distances and various transportation modes, such as air, sea, and land transportation for calculating unit shipping costs. The mathematical models and project outcomes will be presented.

The Divine Divide: The Intersection of Theocracy and Abortion Legislation

Molly Doyle, COM 450: Communication and Society
Faculty Mentor: Professor Ann Liao, Communication
Abortion restrictions have grown dramatically in both number and severity as social and religious conservatives have mobilized to test the limits of Roe v. Wade and post-Roe court rulings. This study aims to examine how the media portray the anti-abortion movement and to see if the message they convey plays a role in how the issues are dealt with in American legislation. Appling the theory of framing, the current study analyzes the unidimensional, multidimensional, and medicalization message frames in the anti-abortion movement. The framing of a message shifts depending on the audience it is being projected to. Both the media and elite decision-makers use the three dimensions of framing when arguing for their cause. This research shines a light upon the use of televangelist media and other combinations of religion and modern telecommunications. I will critique the theological aspects involved within the media and the persuasion used, along with the abortion legislation that has stemmed from their successful outreach. My presentation will include a poster along with a visual storytelling aid made with archival digital collaging.

Ashrae Design Contest

Daniel Erckert, **Ibrahim Raqib**, **Daniel Wendel** and **Matthew Gibson**, ENT 422: Machine Design II
Faculty Mentor: Professor Jikai Du, Engineering Technology
As an overview of this competition we are going to be specifying the most efficient sizing for an HVAC system for a research facility in Cairo Egypt. We were given schematics of the buildings sizing, the room shapes sizes and purpose, as well as what directions the building is facing relevant to the sun (which will be important for required heating and cooling analysis) and where the building is located relative to the equator so we can see where the sun will be projecting on the building. A major aspect of the calculations portions of the competition is going to be what this research facility is going to be made out of. A lot of this general information is going to be supplied by our sponsor because they possess the knowledge of what normal commercial buildings are constructed of. This choice in building materials is very important because it will change how efficient the building is which ASHRAE has provided us with a list of codes that the building will need to meet like air quality and ventilation as well as insulation requirements. In our calculations we will compile the building schematics and calculate how large of a HVAC system will be required to meet these minimum requirements and provide this research center with the correct heating and cooling.

Growth and Investigation of Barium Titanate Thin Films

Abrar Fayaz, Physics
Faculty Mentor: Professor Ram Rai, Physics
This project investigates the dielectric, optical, and ferroelectric properties of Barium Titanium Oxide (BTO) thin films. The thin films were deposited on single crystal substrates by the radio frequency magnetron sputtering technique, which uses accelerated ionized gas to sputter the target material, in this case, Barium Titanate. Once BTO films were produced, the crystalline structure of the thin film was studied using an x-ray diffractometer. Next, optical measurements were taken with an optical spectrometer. These measurements were used to determine the band gap of BTO. Once structural quality films were produced, preparations for ferroelectric measurements commenced. This was done by first sputtering a thin gold layer on top of the BTO film, which causes the sample to behave like a capacitor. Data of polarization as a function of voltage or electric field at different frequencies will be presented for the BTO sample. Dielectric properties as a function of frequency were also measured, and the behavior of the dielectric constant at different frequencies was observed. All the BTO film data in this project were collected at room temperature.

Wendy Carlos: The Original Synth

Lindsey Roth, DMP 491: Capstone in Digital Music Production
Faculty Mentor: Professor Tomas Henriques, Music
This presentation explores the impact of American composer Wendy Carlos and her Grammy-Award winning album Switched-On Bach on popular musical culture. Her interest in inventor Robert Moog's new Moog Modular Synthesizer led to Switched-On Bach, in which she re-interpreted multiple works by Johann Sebastian Bach using the synthesizer. Although she is known today as one of the first transgender women to transition in the public eye, electronic and popular music would not be so closely intertwined had it not been for this formative album. To create a detailed portrait of Wendy Carlos and Switched-On Bach, I examine her life, work, and the state of the electronic music industry as she was developing the album. I studied articles and books written

about Ms. Carlos, Robert Moog, and the Moog Modular Synthesizer; in addition, I listened to video and audio interviews to hear her perspectives on her instrument, the creation of the album, and electronic music as a whole. I also heavily investigated her personally-curated website, which is the largest resource made up entirely of her own writings. Most modern research on Wendy Carlos credits her talent solely to her gender identity; she has since chosen to retreat from the public eye due to the treatment she has received. Most of her albums, including Switched-On Bach, also became inaccessible in the early 2000s due to distribution issues. These elements have led Ms. Carlos to be a lesser-known figure in the music industry; yet, without Switched-On Bach, synthesizers and electronic music elements may have never found their way into popular music. Through this presentation, I seek to give Wendy Carlos the public recognition that she deserves in a way that will respect her legacy.

Out of This World!

Matthew Nunez and **Taylor Grad**, ENT 422: Machine Design II
Faculty Mentor: Professor Jikai Du, Engineering Technology
Our goal for the team is the completion of the rolling chassis of the SUNY Buffalo State rover. This rover is similar to the ones used on mars and we will be designing and assembling just that. This project is slowly being built by multiple students in different departments in its second semester of life. First, we have the mechanical engineering students who are in charge of designing and building the rover chassis in conjunction with the senior electrical engineering and computer science students. We would like to have a working prototype by the end of the semester so future Buffalo State students have a model to work off of for the University Rover Competition (URC). For the Buffalo State students who would like to participate in the (URC), this is the first step towards that goal. Although we won't be able to finish the rover in time for the competition, we will be doing our best to set up future students and engineering teams for success. While the rover was based on the UCR guidelines, we had to scale it down and make it smaller because of the budget that we had to work with. This prototype will show what the engineering seniors of Buffalo State College are capable of achieving.

SAE Mini Baja: An Engineers Competition

Nicholas White, **Joseph Wikar**, **Oscar Handley**, **Edwin Diaz**, **Rodger Powers** and **SoeSoe Aye**, ENT 422: Machine Design II
Faculty Mentor: Professor Jikai Du, Engineering Technology
The SAE Baja competition challenges undergraduate engineering and engineering technology students in research and development, testing and analysis, and project management under strict cost and time constraints. Each year Buffalo State University's final exhibition project for graduating seniors is to construct a functioning Baja vehicle to represent the university in one of the three annual competitions. A Baja vehicle consists of a chassis, body panels, drivetrain system, suspension system, steering system, braking system, safety components, and an electrical system. The scope of this semester is on the drivetrain system, steering and suspension systems, and chassis, which are split up into three teams, respectively. The drivetrain team is responsible for designing, purchasing, and fabricating the vehicle components responsible for propulsion, which applies power from the engine to all four wheels. The steering and suspension team is responsible for the directional control and stability of the vehicle. The team must design and develop a system that will withstand and cushion the forces of off-road terrain. Lastly, the chassis team is responsible for the design and fabrication of a reliable frame that will coincide with and accept the designs of the steering and suspension team, as well as the drivetrain team. All components of this vehicle work cohesively to meet the competition guidelines set forth by SAE and test the skills of Buffalo

State University's future engineers. This project will continue throughout the following semesters, and comprehensive design plans and procedures will be passed down to incoming team members.

Magnetic and Transport Phenomena of Single-Crystalline Rare-Earth-Based Kagome Magnet

Christopher Burgio, **Jacob Casey**, **Asraf Sawon**, **Jamaal Huff** and **Noah Kramer**, PHY 295
Faculty Mentor: Professor Arjun Pathak, Physics
The research on topological materials has attracted great interest in the scientific community for both fundamental study and application perspectives in spintronic devices. Among such materials system kagome lattices, with corner-sharing triangular networks of transition metals within the plane (two-dimensional) have been reported to emerge as potential facilitators for correlated and topological phenomena. Such a peculiar geometry of transition metals in kagome lattice leads to several novel quantum phenomena such as anomalous Hall effect, Weyl semimetal, Dirac fermions, etc. The latest works in rare earth (RE)-transition metal-based REMn6Sn6 have illustrated that this family could be fascinating to investigate various physical phenomena due to large spin-orbit coupling and strong magnetic ordering [Phy. Rev. B 104, L161115 (2021)]. However, high-quality samples are still limited, and a detailed study of magnetism and electrical transport is also lacking. Therefore, the understanding of fundamental science and thereby the design of the materials for future quantum computation applications is limited. In the last two years, we have been working on the synthesis of various high-quality single-crystalline magnetic topological materials and investigating their details of magnetic and electronic properties. As an example, in this presentation, we focus on the synthesis of single-crystalline REMn6Sn6 (RE = Er, Ho) materials. We also discuss the magnetic and electrical properties of REMn6Sn6 at a temperature between 2K to 400K and applied magnetic field up to 90kOe. This work was performed at the State University of New York (SUNY), Buffalo State University, and supported by the National Science Foundation, Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS) program under Award No. DMR-2213412.

Placenta Preparation Practices: Do Human Consumers Reap Pain-suppression Benefits?

Ashlynd Cox, **Elise O'Donnell** and **Angie Felix**, PSY 499: Independent Project
Faculty Mentor: Professor Jean M. DiPirro, Psychology
Placenta ingestion during and immediately after delivery is practiced by almost all mammals. Research in our lab has shown that rat mothers that consume their placenta experience reduced pain sensitivity, and that the molecule that does this work is found in all species of placenta tested so far (i.e., rodent, cow, dolphin, human). Our research has also shown that the placenta effect occurs in non-pregnant female and male rats, and that it requires opioid-receptor activation. Considered together, this information suggests that placenta contains a substance (named Placental Opioid-Enhancing Factor [POEF]) that may have medicinal benefits (i.e., increased pain-relief properties) if extracted or synthesized for human medical use. The present research considers placenta ingestion by human mothers and asks if the current preparation and storage procedures they use before ingestion preserves the placenta effect. Full-term healthy human placenta prepared according to current human practices (e.g., freeze-drying, freezing, dehydrating) will be fed to rats and the effect on morphine-induced pain relief will be tested. This study is currently underway.

Social Exclusion and Sexual Victimization in College Students: The Role of Gender

Alyssia Schwab, Psychology
Faculty Mentor: Professor Kimberly Kamper-DeMarco, Psychology
Sexual victimization is problematic in college aged individuals with over 20% of college-aged students reporting experiencing rape or sexual assault during this time. Sexual victimization refers to any unwanted sexual advances that are made upon the victim. It is well established that rates of victimization are higher among college women than men with approximately 90% of victims being female. Sexual victimization is a risk factor for a number of negative outcomes including mental health concerns, relationships difficulties, and substance use. For individuals who experience sexual victimization, social exclusion may be associated with this due to the ostracism associated with the victim. Social exclusion relates to feeling left out, isolated, and/or separated from a social group or situation. Understanding how peer relationships may impact sexual victimization may be an important factor in understanding how to prevent sexual victimization. The goal of this study is to examine the possible association between social exclusion and sexual victimization in college aged individuals and the role of gender. We will use data collected from a cross- sectional study of college aged students using an online survey. In order to assess sexual victimization and social exclusion, subscales will be created using The Peer Victimization in College Survey. Correlations will first be examined, followed by moderation analyses using the PROCESS macro in SPSS to examine the role of gender on the association between social exclusion and sexual victimization. Results will be discussed.

Abortion Around the World: Abortion Rates and U.S. Hegemony

Talia Peeler, PSC 470
Faculty Mentors: Professor Patrick McGovern, Political Science & Public Administration, Professor Mehwish Sarwari, Political Science & Public Administration and Professor Peter Yacobucci, Political Science & Public Administration
As a global hegemon, the United States is influential through both its internal and external behaviors and policies. The research presented here examines the effect of restrictive abortion legislation in the U.S. on other nation-states. Previous research demonstrates that there are a multitude of factors affecting how a nation-state might draft abortion legislation and the number of abortions performed per capita, including regime types, the nature of the legislative process itself, medical policies, the presence of strong women's rights inputs, number of female representatives in government, and the strength of religion. The research presented here uses data on variables such as regime type, the dominant religion, per capita income, as well as the strength of U.S. influence on a nation-state to determine which variable has the greater impact on abortions. Much of the data was also collected from public-use data collectors such as The World Bank and Freedom House. After running multiple ordinal regressions through SPSS, only two variables were found to be statistically significant in how a nation drafts and executes its abortion laws: the dominant religion of the nation and its crime rates. Although this study included many variables relevant to social norms and current events, these findings reveal that many other factors that need to be modeled in future research. Given the scope of the hypothesis and data in this case, the conclusion of this study is that the effect of U.S. hegemony does not appear to play a significant role in the development of abortion legislation or abortion numbers in other nations.

Spam: Becoming an American Cultural Icon

Daniel Sorge, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
For this project, I will investigate the history of the canned meat SPAM to study how it became a cultural icon and symbol of America from its creation in 1937 through World War II and into the 1950s. Spam is the face of canned meat, and its success defined a whole new era in canned foods. It is thus important to study its beginnings and impact in World War II to understand how a canned meat made of unused parts became such an iconic food both in America and abroad, as a symbol of America as well as proof of a lasting American influence. Methods for this project include studying previous histories on Spam, as well as the writings and experiences of those who consumed Spam, both soldiers and civilians, to write a history that can show the unique factors that led to the success of Spam while similar products, both earlier and copycats failed. Some things I have found in early research include the origin story of Spam, including how it got its famous name, how it proved to be the perfect meal for World War II soldiers, both American and allied, how those soldiers generally felt about Spam, and some of the impact it still has today on culture in Hawaii, Guam, The Philippines, and more. My presentation will include a poster highlighting my research results as well as the conclusion.

Brewing Revolution: Coffee, Coffeehouses, and the American Revolution

Tyler Troyer, HIS 300: Research and Writing Seminar
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
The question the poster seeks to answer is: To what extent did the atmosphere of the coffeehouse brew the American Revolution? The background relates to the coffeehouse. The sources within the research have pointed to the coffeehouse being a secular place where people from all walks of life would gather to discuss topics in a place that was not overseen by the government. This, in turn, would make them perfect meeting places for revolutionaries to discuss ideas and plans. The research, stemming from books, has led to the search for notes and letters that either pertain directly to the meetings or suggest that the meetings did happen. The research at this time has led to the conclusion that it is a more indirect association, and within the American Revolution, coffeehouses were one of the major meeting places of the revolution, though the impact is still profound. Interestingly, a cup of coffee that anyone can get for a few dollars in the modern day is a beverage that profoundly impacted geopolitics for 200-400 years. Cultivation and trade that started in the Near East, which is now the second largest commodity in the world, behind oil.

Forecasting Time Series Data-Stock Index Analysis

Prayushi Bhorania, AMT 495: Applied Mathematics Project
Faculty Mentor: Professor Saziye Bayram, Mathematics
The process of forecasting the stock index is crucial to make vital investment decisions. My research involves a time series analysis on the data to predict the stock price of Meta Platform Inc. Our data required to carry out the research is obtained from Yahoo finance, and it includes the stock prices for the past three years. I study the anomalies in the data and find a supporting reason for a different data behavior in a particular time frame of the data. During this presentation, I will present my findings about this data with my methodologies.

Antibacterial Properties of the Pyrazine-Piperazine Derivatives

Jadelene Adams, Biology
Faculty Mentor: Professor Olga Novikova, Biology
With the rise of the bacterial resistance to antibiotics in the population, there has been a great effort to address this global health issue by innovating new antibacterial compounds that can combat the resistance with precisive bacterial targets. This current study aims to evaluate the potency of the synthesized compounds against gram-positive bacteria, Staphylococcus aureus, and gram-negative bacteria, Escherichia coli. The core of the compound, pyrazine-piperazine (PYZ_PY), was synthesized using the Buchwald Hartwig Amination reaction. The compound was further diversified at the N-terminus by coupling with different heterocyclic carboxylic acids. The MIC (Minimum Inhibitory Concentration) of the resultant analogs was measured by high-throughput assay against bacteria, S. aureus, and E. coli, using standard protocol measuring optical density (OD) on the plate reader. For each trial, antibiotic chloramphenicol was used as a control treatment, while untreated bacterial cultures were used as the negative control. The MIC experiments were followed by plating of the cultures and direct colony count to verify OD observations. Additionally, we performed a Kirby Bauer assay following established standard protocol. Our preliminary data suggest that at least one of the compounds, the derivative furoic acid PYZ_PY, exhibits potential antibacterial qualities against the gram-positive S. aureus. In the future, the experimental compounds will be demethylated at the hydroxyl ends and tested against S. aureus and E. coli to determine their effectiveness.

Stabilizing the Grid: Examining the Implementation of Geothermal Heat Pumps with Battery Storage in Buffalo NY through RTDS Simulation

Zachary Schneider, **Louis Schriver**, **David Peiffer** and **Ashanti Stewart**, ENT 466: Electrical Design II
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Josh Joseph, National Grid
A study is being conducted in the city of Buffalo NY, which has a defined area of eleven residential homes and one commercial building, the Northland Workforce Campus. This study uses Real Time Digital Simulation (RTDS) as an environment to test decentralized power configurations for stabilization of the grid. The project focuses on examining the implementation of geothermal heat pumps with battery storage in the electrical grid. The heat pump and battery data with RTDS and Schweitzer Engineering Laboratories (SEL) equipment incorporate real time communication and control using phasor measurement units (PMUs) to collect data at a rate of 60 samples per second. Research on using PMU's in power systems for power factor correction/automation and overall power quality improvement has been conducted. Development of a controller to regulate power quality within the system is being developed. Using RTDS Technologies NovaCor® processor, a microgrid simulation was created with the defined area as the electrical apparatus currently exists. The battery storage system is used to level out load on the grid by supplying power during high demand and charging during low demand. It also serves the function of a power backup, used to supply energy during grid outages for each location they're deployed. The SEL Real Time Automation Controller (RTAC) is linked to the RTDS NovaCor® as a hardware-in-the-loop configuration, demonstrating real-case usage. The developed simulation case features three house feeders connected to the grid, with the capability of being run off of a battery bank in an island mode. The battery can be charged via human control. The Northland's campus geothermal plant

load data is also featured in the simulation, functioning as another load on the grid in the simulation case.

Drive Guys; Motors and Drives

Ruben Santana, **Joshua Van Lew**, **Mitchell Thornton** and **Adam Hoffmann**, ENT 466: Digital Design II
Faculty Mentor: Professor Ilya Grinberg, Engineering Technology
Aurubis Buffalo is a one million square-foot integrated brass and copper mill, located just north of the Black Rock neighborhood of Buffalo and only one mile from Buff State. Since producing metal generates a significant amount of heat, an efficient means of removing heat is required. A cooling tower (361 Tower) is used to cool and remove heat from many of the machines at the manufacturing site. The 361 Cooling Tower pumps have previously been controlled by motor starters. The goal of this project is to upgrade and modernize the controls of the service pumps within the cooling tower, utilizing the pumps with Toshiba VFDs and controlling them with Allen Bradley CompactLogix PLC. The operation of these pumps is based on the level of water inside the hot well. After the VFDs are installed and commissioned, a cost analysis will be performed using actual data to determine the benefits of the upgraded system while comparing it to the previous system and estimated savings determined during the design project. It is expected that moving to an automated drive system will not only be cost-effective but will also increase energy efficiency, increase the life of the motor drives, and reduce operation and maintenance cost. The project includes selection of VFDs, programming of PLCs, design of the wiring system within the power distribution system of Aurubis, and designing an advanced measurement system inside the hot well of the cooling tower.

Three Phase Training Module

Fatma Alnabhani, **Yeassin Arafath**, **Quinn Schwab** and **Galad Hirsi**, ENT 466: Electrical Design II
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Professor Leonard Fiume, Engineering Technology
The project is to develop a device that is capable of measuring and displaying results for two sets of three-phase voltages. Existing meters allow for the display of only one set of three-phase voltages. The training module will be used by National Grid to train their workers in a safe manner before they commence their job on high-voltage lines. Three-phase transformers can be connected in a bank using three single-phase transformers. This allows various connection schemes that are standard at National Grid. Existing standards, such as ANSI standards and National Grid standards were investigated as well as scholarly sources describing improper phase sequencing, which can lead to failure of connected devices. It is imperative to obtain appropriate phase sequencing. This is accomplished by the development of the training module and displaying information in a way easily comprehensible by line mechanics. Existing methods are available to measure and display results for only three outputs. The project develops methods and devices to measure and display six outputs, which was not done before and is not available commercially. Based on the project goals, the following approaches/methods were utilized: decomposition, functional analysis, synthesis, testing and evaluation. Larger systems are divided into subsystems with their own objectives; individual subsystems are completed with the goal of integrating them into a larger and more comprehensive system.

How Raw is Our Sewage? Examining Treatment Plant Discharge Levels

Grace Brzykcy, GES 499: Independent Study
Faculty Mentor: Professor Elisa Bergslien, Earth Sciences
The Erie County Division of Sewerage operates seven sewer districts, with six wastewater treatment plants outflowing into Lake Erie as well as other local waterbodies. Historically, there have been many releases of untreated sewage in the region impacting local water quality. Heavy metals are potentially a persistent indicator of such discharges. A study was conducted in Fall 2022 to determine levels of heavy metals discharged from Western New York's wastewater treatment plants into local waterways visualizing the impact these outflows had on the area. To accomplish this, water samples were taken from seven sites across the area including: Attica, Amherst, Blasdell, Buffalo, Tonawanda, North Tonawanda, and Darien. We anticipate higher levels of heavy metals downstream of treatment plants, and urban sites output concentrations to be higher as well. On three separate days samples at each plant were taken both upstream and downstream from the discharge pipe. Samples were examined in the laboratory with a 100mg/l gallium standard added for quantification. Samples were then pipetted onto a sample carrier and analyzed using total reflection x-ray fluorescence spectrometry (TXRF). TXRF is a non-destructive, multi-element analytical method based on energy dispersive X-ray fluorescence spectrometry with detection limits in the part per billion range. The samples exhibited higher downstream levels versus upstream, with a few exceptions. Results also showed that Attica's plant released the highest values of most heavy metals tested for, proving our concentration expectations to be false. The new question is if this due to agricultural runoff, or because rural treatment plants are less advanced.

Research in Cell Physiology Using Hydra

Davon James and **Precious Adegor**, BIO 301: Cell Physiology
Faculty Mentor: Professor Martha Skerrett, Biology
Hydra is a tiny (5-30 mm) freshwater coelenterate and is a popular research tool for developmental biologists. Hydra has received less attention as a model organism for cell physiology studies. Several aspects of Hydra biology make them ideal organisms for student projects aimed at correlating behavioral responses with cellular mechanisms. These include the ease with which they are maintained, their observable responses to stimuli, detailed knowledge of their cell and tissue types, and availability of genome sequence and several transcriptomes. Here we detail experiments conducted by students in an upper-division Cell Physiology class and explain how such experiments enhance understanding of physiological mechanisms at the cellular level. In one experiment, the preference of Hydra for light of different wavelengths was observed and quantified, the results were put into context using primary literature, and the genome of H. Magnipapillata was examined for genes encoding light-sensitive proteins such as opsins. In another experiment, micromolar to millimolar levels of caffeine were added to the extracellular media, and feeding was quantified (# of brine shrimp consumed). Millimolar levels of caffeine led to paralysis. Literature is being reviewed, and the genome is examined for caffeine-related pathways such as adenosine-type receptors.

Study of the World Happiness Report

LaRue Heutmaker, PSC 470: Senior Seminar
Faculty Mentors: Professor Mehwish Sarwari, Political Science & Public Administration and Professor Patrick McGovern, Political Science & Public Administration

The UN Sustainable Development Network's World Happiness Report annually ranks countries based on their happiness after extensive research on their stability and overall civilian satisfaction, with their top five countries consistently being Scandinavian and Finland being number one four years in a row. While some criticize this study and argue that happiness cannot be measured, Scandinavia's advancements in society are observable and trackable, lining up with their advanced and renowned universal healthcare system. This research study looks at the structure of different healthcare systems in democratic nation-states, their healthcare expenditure, and economic growth with controls such as mental health, democratic stability, gender equality, and ethnic heterogeneity. Major findings in this study show that a strong economy with a strong healthcare expenditure from their GDP per capita creates a strong causal relationship with the World Happiness Report results.

Fumble Rumble – A Study of Football Consumption in America

Keontae Key, COM 450: Communication and Society
Faculty Mentor: Professor Ann Liao, Communication
This research paper will answer the question of why people watch football here in America. Football is a North American thing mainly being played in the United States. As for other countries in the world, soccer/football is the most consumed sport that people watch daily. So, I will be breaking down the history of how American football rose to become the most watched sport within this country and why the other major sports like basketball, hockey, and baseball do not gain as many viewers as football. Grounded in the uses and gratifications research, I will survey individuals on why they watch football. Because football is the most watched sport here, I can achieve the goal of documenting the gratifications that people receive from watching football. This will be a fun task to tackle as I love to watch football and have my own reasons so I can't wait to hear others.

Functional Magnetic Materials for Energy Application

Asraf Sawon, Electrical Engineering, **Jacob Casey**, Physics, **Noah Kramer**, Electrical Engineering, **Christopher Burgio**, Physics and **Grace Brzykcy**,
Faculty Mentor: Professor Arjun Pathak, Physics
Novel magnetic materials play a critical role in numerous functionalities in electronics, high-speed computing devices, clean energy, automotive, and defense. In the last few semesters, we have been working in Prof. Pathak's research lab and helping synthesize various magnetic materials such as rare-earth and transition metal-based intermetallics compounds that potentially show large cooling effects. For example, we have worked on the synthesis and optimization of multi-component Mn-Fe-Ni-Si-Al alloy systems that show a large magnetic entropy change, are one of the key parameters to quantify the cooling capacity of the materials. However, this system shows a large thermal hysteresis, an unwanted characteristic for cooling applications. We have been working to reduce such thermal hysteresis by preserving a large magnetic entropy change. Another project we have been involved to grow single-crystal rare-earth magnetic materials. In this presentation, we present our effort to design, discover, and understand materials that undergo magnetic and structural phase transition near room temperature which exhibits large magnetic entropy changes near the phase transition. This work was performed at the State University of New York (SUNY), Buffalo State University, and supported by the National Science Foundation, Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS) program under Award No. DMR-2213412.

Industrial Automation

Michael Avery, Electrical Design II
Faculty Mentor: Professor Ilya Grinberg, Engineering Technology
The goal of the project is to explore the capabilities of the automated world through the use of a Programmable Logic Controller (PLC). The project is performed with Motion AI company to design and program a Triplex pump application with a “derag” function. Schneider’s Modicon M340 PLC and A Proface Blue Open Studio SCADA package Human-Machine Interface (HMI) to monitor and control the system are utilized. The project incorporates three separate water pumps that are controlled by the program which features a “derag” function. This allows the pumps to start up in reverse to remove any debris on the pump's impeller and increase the efficiency of the pumps. The PLC is the core of the system, collecting information from the level sensors indicating when each of the pumps will be turned on. The HMI provides the end user a visual information about the water level in the tank, which pumps are running, as well as maintenance, and run-time information. As part of the project, SCADA software is developed to generate a daily report on above -mentioned features to allow access to dashboard information from any device, such as a computer, cell phone, or tablet anywhere in the world. Aveva Insight package is utilized to provide remote access to this report. The system allows users to receive specific warnings, check system status, and make changes to parameters if necessary. The goal for this project is to create a self-monitoring system that can be accessed from any network providing secure connections.

Certain Adverse Childhood Experiences Predict Eating Behavior in Adulthood

Victoria Sasso, Psychology
Faculty Mentor: Professor Naomi McKay, Psychology
There is evidence that physical abuse in childhood leads to higher BMI in adulthood. One aspect that is missing from this previous research is if a change in eating behavior goes along with these higher BMIs. Therefore, the goal of the current study was to look at the experience of physical abuse in childhood along with other Adverse Childhood Experiences (ACES) and their effect on eating behaviors and BMI in adulthood. The hypothesis was that BMI and negative eating behaviors would be increased in individuals who experienced childhood physical abuse. There were 487 Buffalo State University students, 18 to 50 years old, who took an online survey that included a food intake questionnaire and the ACES questionnaire. The participants then had to provide their height and weight so their BMI could be computed. The food intake questionnaire measured participants’ average intake of certain foods and drinks, including caffeinated drinks, diet drinks, and a variety of healthy and unhealthy foods. Results showed that there was no significant effect of childhood physical abuse on BMI or eating behavior. However, participants who had a caretaker in prison during childhood consumed significantly more soda, diet soda, energy drinks, frozen meals, lean and fatty meats, and dairy in adulthood. In contrast, no relationship was found between caretaker in prison and BMI. This work is a good starting point for further research regarding specific Adverse Childhood Experiences and their connection to eating behaviors and thus, its connection to BMI.

Geriatric Geopolitics: Age, Corruption, and National Birth Rates

Kai Phanhthalath, PSC 470
Faculty Mentors: Professor Patrick McGovern, Political Science & Public Administration, Professor Mehwish Sarwari, Political Science & Public Administration and Professor Peter Yacobucci, Political Science & Public Administration
Globally, geriatric nations are growing in number and their effects on an already volatile political environment are evident. Whether a country is developing or well-developed, birth rates affect not only short-term policymaking, but also its socio-economic well-being in the long-term. Literature on birth-rates and their relationship with politics highlights aging populations in much of the developed world. In addition to the negative impact of age on procreation, the same literature also explores per capita income, direct national policies limiting birthrates, the presence of a strong commitment to women's rights, economic, political, and social stability within a nation, and corruption levels. The theory explored herein suggests a reduction in birthrates when corruption levels rise because of the concomitant rise in political instability [people don't want babies in uncertain times]. Data analyzed here was provided by the World Bank and the Corruption Perception Index. Variables were assessed in SPSS with a multivariate, linear regression model. Results from this analysis reveal that economic factors like GDP and employment rates have no definitive correlation to birth rates. However, with respect to my main hypothesis, corruption, rather than having a negative effect on birthrates, tends to increase them instead. The political instability usually associated with corruption does not apparently, at least in this model, keep people from having children, while aging populations do.

African American Soul Food: Colonial and Civil War Era, 1619-1865

Morrigan Waller, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
Soul Food is a culinary tradition that has been celebrated in the African American culture in America from the beginning of the colonial times to the Civil War. Between 1815 and 1865, African food culture was introduced to America when enslaved Africans were forcibly moved across the Atlantic. The history of the relationship between the soul and the African American people and their food How African Americans essentially made this food culture into what it is today This study aims to use primary sources like cookbooks, recipe books, and newspaper articles to show evidence of how African American food was used during the Antebellum and Civil War periods. These sources will demonstrate how African American cooks used their food to survive during this period of cultural diaspora. This study also aims to outline the origin of this food culture. Contrary to what has been assumed, there is evidence that shows that soul food was not invented in the South. Many wanted to believe that this food culture was created in what is today the U.S. South, but it was only brought over there. During the time of the Atlantic Slave Trade, many of those who were enslaved brought their traditions and recipes over with them when they were forced to move. It was not until the Civil Rights and Black Power Movements that this food culture was given the name Soul Food.

Grapefruits and Cabbage Soup: American Fad Diets of the Mid-Twentieth Century

Abby Marks, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This project seeks to explore American fad diets of the mid twentieth century (1920s-80s.) From grapefruits to cabbage soup, this time period produced an abundance of diet plans. This research examines fad diets as a phenomenon caused not by the individual but by a society where medical

concerns over body weight were met with popular notions of beauty that called for thinness. While fad diets do not necessarily have a single definition, they are sold as the best and fastest approach to weight loss. The 1920s brought the emergence of America's devotion to thinness and made weight loss a predominantly female domain. Emerging food trends do not equate to a complete shift in American cooking habits for most, but rather a shortcut or a quick fix. The research will include an analysis of articles and advertisements promoting fad diets and pills from magazines like Photoplay, Fashionable Foods: Seven Decades of Food Fads by Sylvia Lovegren, that offers bountiful recipes from cookbooks published in the twentieth century, and William Banting's Letter on Corpulence. Key questions to be answered with this poster presentation include: What were fad diets (how were they believed to work)? Who was promoting fad diets? What were the grapefruit and cabbage soup diets (how were they believed to work?) What was the American beauty standard and when did it change? How did societal pressures effect fad diet trends?

The Effects of Nicotine on Short-Term Memory and Trial and Error Learning

Lucas Patton, PSY 498
Faculty Mentor: Professor Pamela Schuetze, Psychology
The impact of nicotine use on cognitive functioning has been subjected to rigorous testing and observation, with most research done using rodent model. However, there is a discrepancy between rodent-centered and human-centered research on its effect on cognition. Research using rodent models found that nicotine use impaired various aspects of rodent cognition while human research has found that some cognitive abilities are enhanced in the presence of nicotine. The current study will investigate if short-term memory and trial-and-error learning are enhanced with the presence of nicotine in a sample of college students. Participants will visit the lab twice, 3-7 days apart. During both visits, they will complete a short-term memory test with a list of simple, unrelated words and a trial-and-error learning test with a pen-and-paper maze. During one of the visits, participants will be asked to chew nicotine gum prior to completing the cognitive tasks. During the other visit, they will chew gum that does not contain nicotine. The order of the conditions will be counter-balanced and both participants and the researcher will be blind to the participant's condition (double-blind design). It is expected that after the nicotine treatment, individuals will correctly recite more words and complete the maze more efficiently than after the placebo treatment.

Effects of Food Type on Cortisol

Taha Ghadeer, **Brittany Campanella** and **Morgan Harrington**, PSY 495
Faculty Mentor: Professor Naomi McKay, Psychology
Very few previous studies have examined the anxiolytic effects of food on the stress response. These few studies hypothesized that unhealthy food would be more effective in reducing stress than healthy food, but their findings did not support this claim. However, the previous literature did not explore the aspect of food intake where the participant gets to choose what food type they prefer while they are stressed. The current study hypothesizes that eating food high in fat and salt will reduce stress and cortisol levels more than foods low in fat and salt. During the study, participants enter the lab and initial hunger, stress, blood pressure, and salivary cortisol are taken. After, there is a mock interview (stressor) followed by a waiting period in which the participant will be presented with snacks that include a variety of healthy and unhealthy options. There will be physiological stress measurements throughout the procedure. In the study, the correlation between calories, and separately macronutrients, to cortisol levels in response to the stressor will be

determined. The expected results are that individuals who consume foods high in fat and high in salt after a stressor will recover more quickly from the stressor, as reflected by lower cortisol levels after eating. These results could help us understand stress better and give us new possibilities to decrease the feeling of stress in people.

Depression and Poverty in Queens

Rayana Johnson, SWK 300: Poverty and Public Policy
Faculty Mentor: Professor Berg Miller, Social Work
What do Poverty and depression look like in New York Queens? The book “Broke in America” speaks on material poverty and the amount of stress it causes, and how poverty increases depression and other psychiatric illnesses. These issues will make it harder for the person to get out of Poverty. Additionally, Poverty is a part of depression because of the number of people who need medicine for these illnesses but cannot get sufficient funds to pay for treatment. The NPR article states, "there is growing evidence that levels of depression are higher in poorer countries than in wealthier ones." Many poorer communities are going through depression due to the Poverty in their communities. The five-year U.S. Census Bureau's 2020 American Community Survey estimates that the typical American household earns "$64,994" to "$71,117" annually. However, many places like Jamestown ranks the poorest, and the typical Jamestown household earns $34,767 yearly. Poverty is associated with volatile income and expenditures, and the government can help but will not. With the number of bills changing as time goes on, resulting worries and uncertainty can worsen mental health. This project is about the fact that poverty is not just a physical but a mental strain on the human body because of the number of funds or lack of funds the person has. The intent is to show people the actual mental effects of money and how humans and the government can decrease the depression and stress people go through due to poverty.

Variations in Cold Season Soil Respiration and Carbon Dynamics

Robert Salefske, BIO 498: Honors Research
Faculty Mentor: Professor Daniel Potts, Biology
The Eastern hemlock is a native evergreen conifer that is widely distributed throughout the northeastern United States. Currently, eastern hemlocks are threatened by the non-native insect, Hemlock woolly adelgid (HWA). HWA-mediated hemlock decline results in more sunlight reaching the forest floor, an increase herbaceous species in the forest understory, and favors the establishment of deciduous tree species. These changes in forest community composition can alter soil microbial respiration by shifting the quantity and quality of shallow soil organic matter. Prior studies on the carbon cycling consequences of HWA-mediated hemlock decline have focused on the growing season while less is known about cold-season dynamics. In this study, I investigated variations in cold-season soil respiration in an abandoned field, a hemlock stand, and a mixed hemlock-hardwood stand. Soils were collected throughout November, February, and March. Microbial respiration from soils collected in each forest type was measured using a closed-chamber gas analyzer in the laboratory. Results show how microbial soil respiration varied across cold-season conditions in the presence and absence of hemlock. Seasonal variation in soil respiration was greatest in the abandoned field whereas seasonal variability was reduced in the mixed stand. In contrast, the hemlock stand had the overall lowest rates of cold-season respiration and the least amount of seasonal variability. Future analyses will quantify how plant communities mediate seasonal variation in soil organic carbon and how soil organic carbon influences respiration in these soils.

Characterization of Connexin30.3 F189Y, a Mutant Associated with Erythrokeratodermiavariabilis (EKV)

Anshuman Jain, BIO 498
Faculty Mentors: Professor Martha Skerrett, Biology and Professor Sujit Suwal, Chemistry
The rare skin disorder erythrokeratodermia variabilis (EKV) is caused by mutations in genes encoding connexin proteins expressed in the epidermis. Cx30.3 is one of several connexins expressed in the stratum granulosum and several point mutations have been correlated with EKV. Characterizing these mutants in cells is an important part of understanding disease. Our studies suggest that Cx30.3 F189Y induces a pathological increase in membrane conductance. Hence, the F189Y mutation appears to produce connexon hemichannels that lead to cell death. The goal of this study is to identify agents that prevent increases in membrane conductance and inhibit cell death associated with expression of Cx30.3 F189Y. Thus far we have identified at least one divalent cation (CoCl2) as an agent that slows cell death. We are examining other divalent cations that may be suitable for topical application. We are also synthesizing peptides and peptoids that may work as connexin-mimetic agents, blocking leaky hemichannels formed by Cx30.3 F198Y.

Senior Project in Photography: Fashion Magazine

Julianne Guercio, FAR 499
Faculty Mentor: Professor Yola Monakhov Stockton, Art and Design
For my Senior Project in photography, I created an inclusive, environmentally conscious, and accessible fashion magazine. If you look at big fashion magazines such as: Vogue, GQ, or Cosmopolitan, they lack diversity in their models and only highlight designer brands. I wanted my magazine, name pending, to showcase a wide variety of models. I achieved this by using both people of all races, sizes, and sexuality. I used thrifted, clothing my models and I already owned, and even created my own clothing so as to not create more clothing waste.

Exclusionary Zoning in Erie County

Cameron Murphy, PLN 499: Geography of Housing Affordability
Faculty Mentor: Professor Jason Knight, Geography & Planning
Exclusionary zoning regulations place limits on the type of housing that can be built in neighborhoods, with common restrictions including minimum lot size requirements, minimum square footage requirements, height limits, and the prohibition of multi-family housing altogether. When implemented in a municipality, these policies can make it extremely difficult or even impossible to construct affordable and dense housing in wealthier suburban communities which prevents low-income families from accessing higher quality public services like education as well as better employment opportunities. Additionally, the lack of adequate and reliable public transportation also contributes to the degree of access that people have between their residence and place of employment. In order to examine and assess this issue in Erie County, municipal zoning codes were collected to identify regulations that would make it difficult to construct denser housing, NFTA Bus Route data was collected to determine the most accessible locations for the construction of new housing, and data from the U.S. Census Bureau was used to identify major employment centers in the county that overlapped public transportation routes. After overlaying data from the NFTA and U.S. Census Bureau in ArcGIS Pro and examining which municipalities had the most/least exclusionary zoning policies I was able to determine which regions would be the most suitable for constructing new multi-family housing units. The poster will include infographics, maps, and charts related to the issues and data discussed above.

Determinants and Tournaments

Jenna Wlostowski, MAT 491
Faculty Mentor: Professor Robin Sanders, Mathematics
Determinants are defined as a number that is associated with a square matrix. A determinant can be computed by using row reduction. Tournaments exist where each member of the group plays all other players and there are no ties so each player either wins or loses. Tournaments relate to determinants in the idea that tournaments can be shown in the form of a square matrix and one can then find the determinant of the matrix of the tournament. In finding the determinant of the matrix allows one to understand the more information about that matrix. In my past experiences with matrices, I've mainly viewed them as functions instead of looking at them as parts of a whole thing like tournaments can be viewed as. I would like to take a deeper dive into how someone can use this information to study the data gathered in the tournament and how it can be applied to real world scenarios. Based off of the square matrices formed by ones and zeros being called tournaments, I can see them being applied to sporting games. This makes me wonder if finding the determinants can help with sporting predictions.

Surviving the Storm: Lessons Learned from the Blizzard of '22

Margaret Bilquin, **Jamie Bommer**, **Chloe Ciranni**, **Ralph Garret**, **Kelley Hoffman**, **Patrick McMahon-Eagan**, **Madison Palmatier**, **Destiny Rivera**, **Joseph Rodriguez**, **Mykayla Williams** and **Sunny Willis**, GEG 386: Weather & Society
Faculty Mentor: Professor Stephen Vermette, Geography & Planning
From December 21 to 26, 2022, a historic extratropical cyclone created winter storm conditions, including blizzards, high winds, snowfall, or record cold temperatures across the majority of the United States and parts of Canada. The area that was arguably the hardest hit was Western New York, especially the City of Buffalo. The Blizzard of '22 hit Buffalo on December 23rd, causing widespread disruption and damage across the city throughout its duration. Despite weather warnings and forecasts predicting the severity of the storm, many residents were unprepared and the government's response was perceived as inadequate. This poster examines the causes and consequences of the blizzard, and the reasons why people were dissatisfied with the government's handling of the crisis. Using qualitative data from interviews with residents, emergency responders, and government officials, we identify key factors that contributed to the government's ineffective response, including inadequate preparation, communication breakdowns, and insufficient resources. We also highlight the social and economic impacts of the blizzard, particularly on vulnerable communities. Finally, we offer recommendations for improving government response to future extreme weather events, emphasizing the need for more robust planning, better communication, and greater equity in emergency preparedness and response.

Effect of Cognitive Dietary Restraint on Stress Reactivity and Caloric Intake

Tamari-Rose Love, Psychology and **Cecelia Redding**, Psychology
Faculty Mentor: Professor Naomi McKay, Psychology
Previous studies have found that those high in cognitive dietary restraint are more likely to display elevated eating behaviors in response to stress. The proposed research will aim to determine if elevated cortisol levels in these individuals predict the reaction of stress eating. The current study

hypothesizes that higher cortisol levels after a stressor in individuals with high cognitive dietary restraint will have a higher caloric intake than those with low cognitive dietary restraint. To test this, participants are brought to the lab and put through a stressor. Either during preparation for the stressor or after going through the stressor they are provided with snacks. Measures of stress such as blood pressure and saliva samples (that will be analyzed for cortisol), are taken before and after the stressor. In addition, participants complete a questionnaire on cognitive dietary restraint. The independent variable is cognitive dietary restraint with two levels, high and low restraint. There are two dependent variables, calorie intake and cortisol levels. The expected results are that individuals with high cognitive dietary restraint will have a higher calorie intake compared to individuals with low cognitive dietary restraint. The expected results are also that we will see higher cortisol levels in individuals who have high dietary restraint compared to individuals with low cognitive dietary restraint. It is essential to find out the reasons some humans stress eat because then we can identify what groups of people are prone to stress eating and determine the best ways to prevent it.

Pepsi's Rise to the Top During the 1980s

Ryan Sherk, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
PepsiCo has always been overshadowed by Coca-Cola in the soft drink industry. This began changing in 1975 when PepsiCo rolled out their newest marketing campaign, the Pepsi Challenge. The Pepsi challenge consisted of a blind taste test in which individuals would consume an unmarked cup of Pepsi and Coke, a majority claimed that Pepsi was the sweeter and better tasting soft drink. This campaign finally made Coca-Cola recognize PepsiCo as a competitor in the soft drink industry and would officially kick off the Cola Wars. The Cola Wars would be known as the targeted marketing campaigns in which each company battled with advertisements and new product lines to become the dominate share holder of sales in the soft drink market. Coca-Cola would roll out “New Coke” in response to the Pepsi Challenge, and it was an utter failure. In result they resorted back to their original recipe within 90 days. PepsiCo would continue to gain ground on Coca-Cola with a new marketing campaign featured in the 1980s, which was focused on the ‘New Generation’ of Pepsi drinkers. These marketing campaigns featured some of the largest popular culture stars of the time, such as Michael Jackson, who would appear in commercials promoting Pepsi. PepsiCo began focusing on recruiting a younger generation of consumers. Despite all of PepsiCo’s success from the Pepsi challenge and their New Pepsi Generation advertisement campaign, they were still unable to ultimately dethrone Coca-Cola as the King of the soft drink industry.

Pax Vobiscum: Heaven on Earth in Faure’s Requiem

Melanie Bebak, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Gabriel Urbain Fauré (1845-1924) was a prolific French Impressionist composer who emerged during the late Romantic period. One of the greatest works from his large catalogue is Requiem, op. 48 (1900). Fauré composed a multi-movement work that honors his predecessors in this sacred genre--such as Mozart, Haydn, and Verdi--to create a piece with a wide variety of tonal colors that portrays a broad emotional range. Taking inspiration from many sections of the traditional Catholic Mass, the Requiem is filled with theological references in relation to its musical and poetic aesthetic. Although it is not believed that Fauré composed this piece to memorialize a particular individual, he stays true to the genre's spirit by paying respect to those who have died. Several musical elements and techniques can be observed in the orchestral notation as well as in the chorus and solo voice parts, many of these spiritually related to Fauré’s personal experiences.

Some of these influences include his exposure to Gregorian chant during a lifetime of living in a majority Catholic country. Fauré's education at the École Niedermeyer, a music institution that stressed techniques and concepts related to church music, influenced his career heavily. Eventually becoming a choirmaster and church organist, Fauré utilized this knowledge while composing the Requiem. My analysis explores how Fauré's compositional technique creates a piece that is as technically rich as it is beautiful. When I perform the fifth-movement aria "Pie Jesu" at my Buffalo State voice recital, I hope to use my vocal technique and expressive interpretation to do it full artistic justice. While deceptively simple on its surface, a singer must produce a translucent tone while articulating the text clearly and maintaining breath support through long and delicate phrases. These elements transform the aria into a stunning and angelic piece of music.

Austin Air Purifier

Kyle Kwietniewski, **John Huebschmann**, **Travis Moriarty** and **Brett Warren**, ENT 422: Machine Design II
Faculty Mentors: Professor Jikai Du, Engineering Technology and Professor Edward Purizhansky, Engineering Technology
Austin Air is known as the largest air cleaning facility in the world. Even though that may be the case, there can always be an improvement made. For our project, we will be working with Doctor Edward Purizhansky of SUNY Buffalo State to reduce the amount of noise that is emitted from the Austin Air purifier, by about 15 dB, when it is running while minimizing its reduction in efficiency. Right now, at max output the air purifier is creating 84 decibels of noise pollution in our testing location. We have come up with multiple different idea proposals to do so. These proposals include, adding noise deadening material and frame assembly modifications to the unit, adjusting the fan geometry, and changing the material of the unit from metal to plastic. While moving through the process of illustrating the best overall proposal, we will be looking at the cost, size and limitations of each.

Converting Analog to Digital: An FPGA and Raspberry Pi Adventure!

Lawrence Bailey, ENT 446: Digital Systems Design and Analysis
Faculty Mentor: Professor Stephanie Goldberg, Engineering Technology
The goal of this research project is to control an Analog to Digital Converter (ADC), which is an important electronic device that converts real-world sensor data, such as temperature and pressure, into digital form, where it can be processed and displayed. The ADC will be controlled over a Serial Peripheral Interface (SPI) using both a Field Programmable Gate Array (FPGA) circuit and a Raspberry Pi single-chip computer. Analog test signals will be fed to the ADC, and the digitized values will be sent to the controller using the SPI protocol. The controller will then display the original analog information. This project will involve designing the FPGA circuit and programming the Raspberry Pi using Python programming language. The FPGA on an Altera DE1 Development and Education Board will be used and programmed by the Quartus II software tool. The MCP3004 Integrated Circuit (IC) chip will be used as the 10-bit ADC to convert the analog signals to digital signals. The expected results will be compared to the actual results and analyzed using test equipment such as an oscilloscope and digital voltmeter.

Project COSMOS

Samson Owens, **Makaih Rivas**, **Carmen Pappaceno** and **Kirk Daniel**, ENT 466: Electrical Design II
Faculty Mentors: Professor Ilya Grinberg, Engineering Technology and Professor Jonathan Rosten, Engineering Technology
C.O.S.M.O.S. stands for Computer On-board Scientific Mobile Observatory System. More specifically, C.O.S.M.O.S. is an on-board robotic system whose goal is to enhance scientific exploration and discovery with future intent to be entered into the University Rover Challenge (URC) representing SUNY Buffalo State University. Cumulative improvements to the system are being implemented annually by different groups of students until the C.O.S.M.O.S project is ready to participate in URC. This is a collaborative project, which exercises multi-disciplined fields such as motor control subsystem, software development, sensor networks, and both electronics and mechanical hardware integration. COSMOS can drive on smooth surfaces and has the capability of driving in any direction as it has the capability to turn in place. The user can control speed and direction with a tethered controller that will in the future be upgraded to either a wireless controller or with a program that will be installed onto a desktop computer. All motors of the drive system are independently driven using pulse-width modulation (PWM) from their respective motor controller drivers. Two 12V batteries are independently used to power the rover motor functions. The motor torque was increased compared to previous projects to handle the newly enhanced chassis design, which is 24in long by 18in wide. This is roughly a x1.5 size increase from the previous chassis design. The motors were upgraded from medium speed and medium torque to low speed and high torque, all while maintaining the current and voltage ratings of 0.25A and 12V respectively. Stall torque is increased from 0.292 Nm to 24.5 Nm. Consequently, no-load speed rating is decreased from 6151 RPM to 30 RPM. The open loop motor control software was upgraded to closed loop control software compared with previous designs. The feedback sensor includes encoders to measure RPM. In addition, a frequency to voltage converter to provide the microcontroller with real-time motor speed is implemented. The microcontroller uses a Proportional Integral (PI) closed loop feedback solution to automatically adjust speed. The SMART Power Microcontroller Board provides a software solution to handle the charge and power cycles of both battery sets. The microcontroller handles the decision making of charging one battery while the other battery powers the rover. The SMART Power Relay Board performs the switching tasks. The microcontroller senses when the battery voltage is below the limit, then transfers the system power to the other fully charged battery using relays. Charging of the battery with low voltage is performed with the on-board fixed position solar panel.

Chronic Cannabis Usage and Its Effects on Cortisol

Brent Howes, Psychology and **Kavorn McKoy**, Psychology
Faculty Mentor: Professor Naomi McKay, Psychology
Not much research has been conducted on how chronic cannabis usage affects cortisol. What has been done has shown that chronic cannabis usage blunts cortisol elevation. However, thus far, previous research has primarily looked at diurnal cortisol rather than cortisol elevation in response to a stressor, and only a fraction of the previous literature has looked at how chronic cannabis usage affects cortisol elevation in response to a stressor. The proposed study aims to add to the literature on how chronic cannabis usage affects cortisol elevation and extend the findings to our college population. This study will look at self-reported cannabis usage from female students at Buffalo State University, and how their cortisol levels elevate in response to a stressor. To test this, participants come into the laboratory and complete a mock job interview in front of a 2- or 3-person committee, which is instructed to be disapproving of the participant in order to induce stress. The participant is also tasked with performing a serial subtraction test, subtracting from the number 2,000 in increments of 7. They also give multiple saliva samples that will be used to measure their cortisol. It is expected that cannabis usage will be negatively correlated with cortisol elevation in

response to the stressor. This will both have implications for future studies done on cortisol levels and add to the literature on the anxiolytic effects of cannabis.

Passion of the Rations: Food Distribution during World War I in the UK and Germany

Zion Treadwell, HIS 300: Writing and Seminar
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This project will consider how food distribution and the societal effects of the industrialization of war time rations in the United Kingdom and Germany shaped daily living and battlefield. Because of government involvement in industry during the war, both the UK and Germany were able to distribute more food with less strain on the national reserves. Moreover, there was also new research into food preservation techniques. Both these changes led to revolutions in domestic consumerism consumption. In the end, exploring the pathways and methodology of how food was marketed, curated, and processed, this project will also explore how vaccines and sanitary concerns led to new legislation and health protocols being adopted in both nations. In the end, these changes brought forth new ideas concerning everyday living and helped stop the spread of dysentery and other bacterial infections in combat zones. It also revolutionized military planning long after the brutal years of war between these two alliance leaders.

Financial Overparenting and Financial Self-Confidence Among College Students

Brent Howes, Psychology
Faculty Mentor: Professor Jill Norvilitis, Psychology
Previous research has shown that parental involvement in young adults' lives has increased (Darlow, et al., 2017), and that helicopter parenting is a distinct form of parental control defined by an inappropriately high level of involvement in the parents' young-adult children's lives (Padilla-Walker & Nelson, 2012). Thus far, less research has looked at financial overparenting, which is a subtype of helicopter parenting. This study examined the effects of financial overparenting on financial self confidence in 112 college students at Buffalo State University. Participants were asked to fill out self-report questionnaires that would show the amount of control their parents have in their lives and their level of financial self-confidence. It was hypothesized that financial overparenting would be negatively correlated with financial self-confidence; the results supported the hypothesis. It was also shown that other types of parenting on finances such as teaching and facilitation were positively correlated with financial self-confidence. The results suggest that financial overparenting may be counterintuitive to parents who engage in its' goals as parents to helping their children develop into independent adults. This research can help us better understand what approaches to parenting are more conducive to confidence and independence, specifically in regard to college aged children.

Understanding Hereditary Mutations in Connexin Channels: A Course-based Research Project in Biology

Unique Phyall and **Akintoye Akinfemiwa**, BIO 314: Advanced Cell Biology
Faculty Mentors: Professor Martha Skerrett, Biology and Professor Sandra Borbor-Sawyer,
Several hereditary disorders are associated with mutations in genes encoding connexins. The human genome includes at least 20 different connexin genes and these connexins are expressed in specific but overlapping patterns. As part of a course-based research project, students created mutations in the gene encoding connexin 30.3 (Cx30.3), a connexin expressed in the epidermis. About 40 upper division biology students participated in the project (Sp22), working in groups of two to create ten disease-associated mutations. Mutagenic primers were designed to recreate single amino acid substitutions known to cause the rare skin disease erythrokeratodermia variabilis (EKV) and mutagenesis reactions were performed using the Stratagene Quikchange mutagenesis method. Seven mutations were successfully created as determined through Sanger sequencing and sequence alignment. Students then expressed the mutants in Xenopus oocytes for functional analysis. In vitro transcription reactions yielded high quality RNA encoding wildtype Cx30.3 and four mutants (G12D, R22H, C86S and F189Y). After quantification and dilution of RNA, students injected Xenopus oocytes and observed survival after protein expression. Expression of two of the mutations, C86S and F189Y, induced cell death while the other two (G12D and R22H) did not appear to affect cell survival. The results are consistent with studies of other connexins where some mutations are associated with cell death.

Characterization of Cx30.3 and F189Y, a Mutant Associated with Hereditary Skin Disease

Ettan Saiwala, Biology
Faculty Mentor: Professor Martha Skerrett, Biology
Connexin proteins are highly expressed in the human epidermis where they form gap junctions. A connexon is a transmembrane channel composed of six connexin subunits. Characteristically, two connexons form an intercellular gap junction channel. However, connexons can also function as transmembrane channels both physiologically and pathologically. Connexin30.3 (Cx30.3) is one of several connexins expressed in the stratum granulosum layer of the skin. Point mutations in the Cx30.3 gene (GJB4) cause a rare skin disease categorized as erythrokeratodermia variabilis (EKV) involving areas of erythema (reddening of the skin) and hyperkeratosis (thickening of the outer layer of skin). Using site-directed mutagenesis we created the Cx30.3 mutant F189Y associated with EKV and expressed this mutant in Xenopus oocytes. F189Y-injected cells died quickly compared to Cx30.3-injected cells. Characterization using whole-cell voltage clamp revealed an increase in membrane conductance in oocytes expressing F189Y. This conductance was blocked by divalent cations. Using dual cell voltage clamp we observed gap junctions formed by Cx30.3 and Cx30.3 F189Y in paired oocytes.

Predictors of Juvenile Myopia

Shannon McGrath, AMT 495: Applied Mathematics Project
Faculty Mentor: Professor Chaitali Ghosh, Mathematics
Typically known as nearsightedness, myopia is a very common disease of the eye resulting from genetic and environmental factors that often starts in childhood. It is diagnosed when light is incorrectly refracted from the cornea and lens, affecting the focal point due to excessive elongation of the eyeball. This causes images to focus in front of the retina, instead of on it, which results in blurred vision at a distance. Myopia affects an estimated 1 in 3 individuals worldwide and approximately 60% of diagnoses are for juveniles between the ages of 9 and 11 years. Myopia is considered a public health concern due to its relationship with the development of severe ocular

complications such as macular degeneration or glaucoma, and a decreased vision-related quality of life with increased health care costs. This project aims to identify factors that predict the likelihood of the development of myopia within the first five years of follow-up in an observational study of 618 subjects aged 6-9 years. Potential predictors including several ocular measurements, parental history, and environmental factors are considered using standard statistical analysis.

The Effect of Laboratory Stressors on Food Intake

Kavorn McKoy, Psychology and **Brent Howes**, Psychology
Faculty Mentor: Professor Naomi McKay, Psychology
Exposure to stress produces physiological responses that decrease the quality and increase the quantity of food intake. A mock job interview is often employed to induce a stress response in a lab setting; however, responses to the laboratory stressor do not seem to mirror a natural stress response. The current study's hypothesis is that when faced with a more natural stressor, participants will consume more food compared to a traditional lab stressor. Women students enrolled at Buffalo State University are the participants for this study. Participants who come into the lab experience one of three stress procedures: a 'mock job interview', where participants are told they will act out a role of someone interviewing for their dream job, an 'interview' , where participants are under the impression that this procedure is a real interview for participation in the study, and finally, a 'no stress' condition where participants are not given a stressor and instead play solitaire in the laboratory. A variety of healthy and unhealthy snacks are presented to all participants either in anticipation of, or after, the stressor and caloric intake is measured. Each participant's physiological reactions to the stressor are measured through their blood pressure, salivary cortisol, and their heart rate. We expect that participants facing the 'Interview' will consume more food compared to participants facing the 'no stress' and 'Mock job' procedures. Cementing the link between natural stressors, and food intake is a vital part in developing strategies to continue research on how stress influenced food intake.

Transcendental Numbers: All the Numbers We Know Nothing About

Tahmid Rafiyo, MAT 491
Faculty Mentor: Professor Robin Sanders, Mathematics
When we hear the word "number", we think about numbers like 1, 2, 3, 4, ... These are known as the natural numbers. Then we add in 0 and the negative numbers, and we get the integers. We add in fractions, and we get the rational numbers. The final step to fully define the number line and fill the gaps is to define the set of real numbers. This is where transcendental numbers live. And they outnumber the non-transcendental numbers, called algebraic numbers, by a long shot. The set of naturals, integers, rationals and even the set of algebraic numbers are countably infinite while the set of real numbers is uncountably infinite. Therefore, the set of transcendental numbers must also be uncountably infinite. Yet we know almost nothing about them. We call them transcendental numbers because they "transcend" algebra. A transcendental number is defined as a number which is not the solution of a finite and non-zero degree polynomial with rational coefficients. There is no theorem of proving any number is transcendental yet, but we will look at proofs of well-known constants such as π and e which have been proven to be transcendental. We will also look at the Gelfond-Schneider theorem which states, if a and b are algebraic numbers,1 and a is not equal to 0 or 1 and b is not rational then a^b is transcendental. This is just a preliminary look at what transcendental numbers are and how much more there is to find out about them.

Assessment of Social and Health Patterns in Relation to Brownfields in East Side, Buffalo

Kelley Hoffman, **Jamie Bommer**, **Widelson Orsel**, **Angela Nye** and **Caitlyn Parsons**, ENS 300: Environmental Case Studies
Faculty Mentor: Professor Elisa Bergslien, Earth Science
Brownfields are areas of a city that may have toxic pollutants, contamination, or other degradation due to historical misuse in industry, waste management, or otherwise. The existence of brownfields can affect a city in a variety of ways. The value of property near a brownfield site can be negatively affected by the locality of environmental damage and adverse zoning that results. For those who live near brownfields, a decline in certain health factors due to lead and other contaminants in the soil, water, and air may be significant. This research project examines ways that brownfield sites define and affect local populations living on the East Side of Buffalo, New York. The research will use spatial comparison of current zoning, land use, and property values in tandem with demographics of the current residing population. Additionally, the presence of health issues in these communities such as cancer rates, birth defects, asthma, and other factors that may be related to the presence of lead, will be investigated. With input from our partner research groups on this project, results from lead soil samples and the systemic issues discovered from historic information will give additional confirmation or guidance of the patterns we seek to explore and address in local systems and future projects.

Exploring the Cosmos: Gustav Holst and The Planets

Keith Vantino, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
My project explores Gustav Holst's (1874-1934) seven-movement orchestral suite The Planets, op. 32, which personifies the planets in our solar system. The Planets is an example of the modern resurgence of the 17th-century Baroque suite genre in the 20th century, except Holst took a highly individualistic approach that broke the rules of the past. The Planets premiered in 1918 at Queen's Hall, London, performed by the London Symphony Orchestra and conducted by the celebrated British conductor Sir Adrian Boult (1889-1983). My research focus is movement four -- Jupiter: The Bringer of Jollity. This movement honors the Roman god Jupiter and is cast in extended rondo form, having ten different sections and four different themes [A-B-A-C-A-D-A-B-A-C-A]. Jupiter conveys a feeling of the dynamic dance movements that comprised the original Baroque suites. While conveying jollity, the music reflects Jupiter's position as king of the Roman pantheon with regal fanfare themes. My project demonstrates how The Planets is a prime example of Holst's modernization of traditional compositional practices, fitting them effectively into the 20th century.

Aleksandr Goedicke's Russian Pièce du Concours

Christopher Bailey-Robinson, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Composed in 1936, the Concert Etude, op. 49 for solo trumpet by Aleksandr Goedicke (1877-1957) was considered a revolutionary work in the USSR during the Modernist period. The Etude was written by Goedicke during the notorious reign of Joseph Stalin, a time where composing modernist music was heavily frowned upon; nonetheless, Goedicke insisted on straying away from principles of the USSR's socialist realism aesthetic. Goedicke's mastery in both piano and composition came from his extensive and vast musical education. He studied, graduated, and later taught at the Moscow Conservatory, one of the greatest musical institutions in Russia at the time. The Concert

Etude was intended by Goedicke as a highly virtuosic work to showcase the performer's technical prowess and artistic capabilities. Despite its technical demands, however, Concert Etude also exhibits Goedicke's lyricism and sensitivity as a composer. There are many points where this piece exhibits great contrasts, as between its lively, frenetic opening and closing sections and expressively emotive moments in the more lyrical central section of the piece. Concert Etude perfectly encapsulates what an etude should accomplish: through performing this piece, I have gained a much deeper comprehension of the genre and have applied this knowledge to achieve my goal on explaining why it remains popular in the eyes of many trumpet players. Analyzing the immense technical and artistic skill needed to achieve mastery, the Concert Etude emerges as a testament to Goedicke's enduring legacy as a composer.

Predicting the Future: Time Series Analysis of the S&P 500 and the Federal Reserve Rate

Conor Cahill, AMT 495: Applied Mathematics Project
Faculty Mentor: Professor Saziye Bayram, Mathematics
My research is in learning about time series analysis (TSA) and using these tools to study economic indicators. There are many different financial indicators that are used by economists and analysts. The use of time series analysis is one of many useful tools to look at these economic indicators closely. The main goal of my research is to create a predictive forecast using the TSA, that can accurately show what is going to happen in the near future. In order to do this, I gather two data sets of two different commonly held indicators of market performance. The first is the Standards and Poor's 500 index, which is commonly used in media, politics, and economic circles as an indicator of economic success. The second is the Federal Reserve Rate, which is the rate that the Federal Reserve uses to loan to banks. I use Mathematica computational program to conduct my research on these data sets and will report my findings in my presentation.

Music Mates: The Relationship Among Mozart, Stadler, and the Clarinet

Gabriella Colton, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
My project explores Wolfgang Amadeus Mozart's (1756-1791) Clarinet Quintet in A Major, K.581 (1791). I analyze Mozart's role and impact on the clarinet, along with other important works for the instrument that he composed during this period. For example, I discuss musical comparisons with the Clarinet Concerto in A Major, K.622 also written, like the Quintet, in 1791 expressly for the 18th-century clarinet virtuoso Anton Stadler. Stadler's history with Mozart and the clarinet itself is key to understanding this central woodwind instrument. Stadler is also noted for inventing the basset clarinet, which created an extension of the existing clarinet pitch register. Mozart used the new instrument to achieve an expanded timbre, or sound color, in addition to its useful melodic extension. My analytical focus is the final movement of the Quintet, where Mozart uses ornamental flourishes--such as trills and grace notes--to accentuate the instrument's virtuosic abilities and add an extra expressive dimension to the work. There are also interesting modulations that occur, a hallmark of Mozart's innovative late style. My goal is to showcase how a leading virtuoso inspired a great composer--then in the final year of his life--as a result of creative instrumental mastery.

Exploring Woodhenge: Archeoastronomy at Cahokia

Sara LeBarron, ANT 499: Independent Study in Anthropology
Faculty Mentor: Professor Lisa Marie Anselmi, Anthropology
This poster examines the evidence for archeoastronomy at the archaeological site of Cahokia. The inhabitants of Cahokia are best known for the construction of incredible mounds in the largest urban center of the Mississippian period in North America. My research demonstrates how the people of Cahokia used celestial events to construct what we know today as Cahokia's Woodhenges. Archaeologists believe that the circular, wooden structures facilitated the tracking of celestial events such as the changing seasons. This was necessary for agricultural production in the surrounding fields to coordinate planting and harvesting schedules. In addition to their use as calendars, I present and evaluate other hypotheses suggested for the construction of these structures.

Marriage of Music & Poetry: Berlioz Tells Instrumental Stories

Cameron Juzdowski, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Hector Berlioz (1803-1869), one of music history's best known French Romantic composers, nonetheless has his roots in the Classical era. He was significantly inspired by the heroic narratives imbedded in the symphonic compositions of Beethoven. In 1830, Berlioz won the Prix de Rome after multiple attempts. Winning required residency in Italy and he wrote about his resulting sojourn in his Memoirs. One of Berlioz's more notable symphonic compositions, Harold en Italie [Harold in Italy], op. 16 (1848), was inspired by the scenes that he witnessed in Italy. Berlioz uses musical elements that create a compelling narrative in sound. The piece was composed in 1834 when Nicolò Paganini requested that Berlioz write him a virtuosic concerto for solo viola which could be played on his new Stradivarius. When Paganini saw the piece for the first time, however, he thought it was too idiosyncratic and never played it. Berlioz's goal was to present the viola with the same emotional Affekt in the way Lord Byron did in his renowned Romantic epic poem, Childe-Herold's Pilgrimage (1812). My project investigates the artistic inspiration Berlioz found in his own Italian experiences, a situation that I myself have experienced personally through travel abroad. Harold en Italie is comprised of four movements and redefines the Classical symphonic form by giving the viola a solo part comparable to the difficulty of a concerto. Berlioz uses the compositional technique of an "idée fixe," a recurring alluring melody that personifies the character of Harold. The idée fixe was popular among French composers and is a vital aspect of Romantic music. In a sense Berlioz becomes Harold and relives his Italian sojourn through the musical voices of orchestra and soloist.

Expression and Characterization of Erythrokeratodermia variabilis (EKV) MutantsConnexin30.3 G12D and R22H

Hanin Faisal and **Zahraa Faisal**, BIO 498
Faculty Mentor: Professor Martha Skerrett, Biology
Gap junctions allow direct intercellular communication in animals. Each gap junction channel is assembled from a docking interaction between two connexon channels in adjacent cells. The connexon channels are composed of six connexins arranged around an aqueous pore that allows movement of electrical current, ions and metabolites. Connexin30.3 is one of many gap junction proteins that mediate intercellular communication in skin and the significance of connexins in

human epithelial tissue is emphasized by skin disorders that result from their alteration. The expression of Cx30.3 is restricted to the stratum granulosum and mutations in the gene encoding Cx30.3 (GJB4) such as G12D and R22H cause erythrokeratodermia variabilis (EKV). In this project we used site-directed mutagenesis to create EKV mutations in Cx30.3. We then expressed the mutants in Xenopus oocytes and compared their function to that of wildtype Cx30.3.

Hurricane Fiona Aftermath in Puerto Rico: Communities Post-Fiona

Yamilla Tate, Music Performance/English Literature
Faculty Mentor: Professor Lorna Perez, English
Puerto Rico has been a territory of the United States since 1898 and those born in Puerto Rico have been US citizens since 1917. Despite a connection spanning more than a century, Americans residing in the mainland have little knowledge concerning the conditions this relationship brings upon Puerto Ricans. The circumstances Puerto Ricans in the archipelago face due to the political status under the US are those of inequity, economic struggle, and political abandonment. When events like natural disasters occur, these realities are further exasperated, as evidenced by the prolonged state of emergency brought upon by Hurricane Maria. Puerto Rico never fully recovered from this event and was later confronted with a series of devastating earthquakes and COVID19, until finally in 2022, another devastating hurricane affected the country. Hurricane Fiona resurrected the hardships experienced during Hurricane Maria and once again, recovery efforts were challenging for heavily impacted communities. Having lived through the aftermath of Hurricane Maria, I was struck by the tragic congruities of Fiona, and my project centers the local, mutual aid responses on the island. The project takes on the form of a blog where I explore the perspectives offered by different community members in Puerto Rico, document my own experiences, and provide some historical context regarding the precedents that lead to today's Puerto Rico.

Inexpensive Voltmeter and Digital Trainer Using the Arduino Electronics Platform

Diamond Hamilton, ETS
Faculty Mentor: Professor Stephanie Goldberg, Engineering Technology
This research involves the implementation of a Digital Voltmeter and Digital Circuit Trainer using the Arduino Microcontroller system. The Arduino is an inexpensive open-source electronics platform based on easy-to-use hardware and software. The voltmeter and trainer can be used by students in the freshman circuits class, as well as by home hobbyists, to monitor analog circuit voltages, and to provide test inputs and indicators for digital circuits. To obtain a voltage reading of a circuit node, the node can be connected by wire to one of the Arduino Analog input channels. The Arduino's analog sensor is able to convert the given voltage into a digital value that is comprehensive to the Arduino's microcontroller. The digital value can then be processed and displayed by the microcontroller. The Arduino is connected to a PC and so the values obtained from the Analog readings can be viewed on the PC monitor. The system will be designed to have clear well-documented information sent to the PC monitor. For digital circuits, the Arduino Digital Write and Digital Read functions can be used to test the circuits. The digital output pins of the Arduino can be used as inputs to the student's digital circuit. The Arduino digital input pins can connect to and monitor the outputs of the student's circuit so that students can compare their actual outputs with expected results.

The Effect of Peer Victimization on Young Children's Prosocial Behavior

Coralie Theogene, Psychology and **Breonna Pierce**, Psychology
Faculty Mentor: Professor Kimberly Kamper-DeMarco, Psychology
Prosocial behavior is defined as an action that one takes that benefits others. In early childhood, prosocial behavior is associated with developmental milestones like perspective-taking, thus highlighting the importance of the development of prosocial behavior at young ages. Understanding what may help prosocial behavior develop during this period is important to promote this behavior. Peer victimization or being the recipient of aggressive behavior has previously demonstrated links with future aggressive behavior; however, for some children, peer victimization may emphasize the importance for helping behavior as a protective behavior. Therefore, it is critical to focus on the relationship between peer victimization and the impact it has on children's prosocial behavior to gain a better understanding of the likelihood of victims engaging in positive future behavior. Thus, in the current study, we will examine the effect of peer victimization on young children's prosocial behavior. We hypothesize that peer victimization will have a significant effect on the development of prosocial behavior in young children. The current study will be a secondary data analysis of previously collected data using a sample of preschoolers from somewhat diverse backgrounds. Observational and teacher reports will be utilized to examine peer victimization and prosocial behavior across two-time points over the course of an academic year.

Confirmatory Factor Analysis of the Urgency Construct Within the UPPS-P

Catherine Sarich, PSY 295: Self-Regulation and Motivation
Faculty Mentor: Professor Michael MacLean, Psychology
The UPPS-P is a self-report scale measuring five separate aspects of impulsivity. The aspect that this study is focused on is urgency, the tendency for an individual to act impulsively when experiencing high levels of emotion. Originally, the UPPS scale focused only on negative urgency, relating to a person's tendency to act impulsively when experiencing negative affect. Through further research, a new subscale called positive urgency was added, measuring impulsivity when experiencing positive affect. However, there is recent research questioning if these two components of the scale are truly different enough to justify their separation, or if they should be grouped together into one measure of overall urgency. To date, no published study has compared these two models using confirmatory factor analysis. The goal of this study is to conduct a confirmatory factor analysis to compare the goodness-of-fit of a two-factor model, measuring positive and negative urgency as distinct factors, with a one-factor model where they are combined into one construct of overall urgency. We will be using a secondary data analysis of a data set comprised of 298 Buffalo State students. Based on existing research, we predict our results will suggest positive and negative urgency would be better grouped into one overarching measure of urgency. This finding could have important implications for the future measurement of impulsivity and the understanding of how emotion affects impulsivity.

History and Applications of Geometric Probability

Joseph Colson, MAT 491: Capstone Project
Faculty Mentor: Professor Robin Sanders, Mathematics
For my research project, I have chosen to discuss the various aspects of Geometric Probability. I

shall first go over the definition and key concepts of Geometric Probability, including how it is typically represented and why its visual applications are often useful for the kinds of problems it is used to solve. Then I shall discuss some applications of Geometric Probability using two classic examples that require its use in their proofs. These examples are the Glass Rod Problem and Buffon's Needle Problem. Both of these examples will be smaller topics of their own, covering a brief history of the problem's origin, along with the mathematician who proposed/solved them. After the necessary background information has been given, the proofs will be constructed by walking the observer through the process of solving each problem using the concepts of Geometric Probability. I am confident that these two examples of my topic will be of great interest to my observers, and I look forward to presenting them.

Concierto de Aranjuez: Joaquin Rodrigo's Musical Sphere of Influence

Christian Medina, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Joaquin Rodrigo (1901-1999) is perhaps the most influential composer to come from Spain in the 20th century. I strongly believe that he should be regarded among the foremost artists of his era. Although Rodrigo was himself a pianist, he is well known amongst guitar players for composing a wide repertoire for the instrument. None of his compositions, however, approaches the significance of the Concierto de Aranjuez, composed in 1939. It is a highly emotional and compelling piece that I believe should receive greater renown. Although Spain had enjoyed a renowned Golden Age art history, before Rodrigo it was not recognized for the musical reputation it truly deserved. In my research, I highlight the historical magnitude of the Aranjuez concerto and elaborate on the reasons Rodrigo composed it, as well as draw light to the composer as man and artist. One aspect I specifically touch on is how Rodrigo was blind from the age of three, which influenced his entire conception of music. I also address historical events that transpired during the time the piece was originally written--the Spanish Civil War and the beginning of World War II--and how they impacted Rodrigo's expressive ideas. The Adagio movement of the Aranjuez Concierto was later reimagined by the great Miles Davis in 1960. Davis adds a completely new sense of color and feel to the piece. The Concierto has always meant a great deal to me, and as a performer I feel a strong connection to it.

Alma's Adagietto: Gustav Mahler and His Symphony no. 5

Jonathan Golba, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Gustav Mahler (1860-1911) composed his famous Symphony No. 5 after suffering a near-fatal hemorrhage ('hammer stroke') in February of 1901, while conducting at the Vienna Imperial Opera when he was only 31 years old. He recovered fairly quickly and soon met his future wife, Alma Schindler. Like his greatest influence, Beethoven--whose symphonies he often conducted to acclaim--Mahler had arrived in Vienna as one of the supreme musicians of his era. Influenced by Beethoven's celebrated Sixth Symphony ("Pastorale"), Mahler included five movements in his Symphony no. 5, which likewise departs from the Classical symphonic four-movement structure. The first movement is a "Todesmarsch" (death march directly related to the hemorrhage), cast in an opening slow movement stylistically atypical of symphonic structure, whose orchestration begins with a stately trumpet solo in a major key. The fourth-movement Adagietto--the most famous part of the symphony--is said to be a deeply personal musical love letter to Alma. A fine musician and

talented composer herself, Mahler's wife could read between the wordless lines, perceiving its poetic intent. I analyze how Mahler features an embellishment of the “gaze motif” (inspired by Richard Wagner) which symbolizes his feelings and demonstrate the artistic significance of Gustav’s moving symphonic expression and devotion to Alma.

Using Ground Penetrating Radar to Search for a Buried Lake Freighter at Tifft Nature Preserve

Dylan Maciejewski, **William Woiccak**, **Colin Krzystek**, **Grace Brzykcy**, **Chelsie McKinnie** and **Angela Nye**, GES 471: Geology Research Seminar
Faculty Mentor: Professor Kevin Williams, Earth Sciences
Tifft Nature Preserve has experienced several different uses given its proximity to Lake Erie and the terminus of the Erie Canal in Buffalo, NY. Completed in 1884, the City Ship Canal was used for loading of and transporting goods by lake freighters at the railhead / shipping center. Prior to 1938, one such freighter burned and sank while docked. During the 1950s, this area was used as a dumping facility, and the shipping canals were filled in with slag from the nearby ore processing facilities. It is unknown whether the burned freighter was buried during this time or removed prior to filling in of the canals. To help answer this question, ground penetrating radar (GPR) was used in an attempt to locate the potential remnants of the buried freighter. The study site was determined by overlaying older images showing the burned freighter with present-day images. GPR data were collected along parallel transects in a 20 m X 12 m grid to cover the presumed mid-section of the freighter, and a smaller grid of data was collected to locate the bow of the freighter. Data were analyzed in both 2D transects and 3D data blocks, and it appears that the freighter is still buried below the surface. This information helps Tifft Nature Preserve to have a more complete history of their site.

Comparing United States' Prison System to Sweden's

Skylar Mckelvie, COM 450: Communication and Society
Faculty Mentor: Professor Ann Liao, Communication
What is the United States doing wrong when it has one of the harshest prison systems in the world compared to Sweden's "luxury" prison system but still has the greatest percentage of reincarceration? Drawing on the classical and human relations approaches in organizational communication, I will contrast the various strategies used by the American and Swedish criminal justice systems. The socioeconomic/historical evolution that has an impact on the cultures and penal systems in Sweden and the United States is one of the focuses. We may comprehend why the intricate systems are the way they are today by contrasting the lengthy, complex histories of these countries and their prison systems, especially examining the present-day prisons in both Sweden and the United States. The complex nature of reincarceration in both Sweden and the United States would be one of my research questions. Comparing the inmates' prison returns based on the reform strategies employed in both systems would be another research question.

Changes in Wind Direction as Recorded by Aeolian Landforms Near Gill Crater, Mars

William Woiccak, Earth Sciences
Faculty Mentor: Professor Kevin Williams, Earth Sciences
For billions of years, wind has eroded the surface and transported sediment on Mars. These

processes, otherwise known as aeolian processes, form surface features that record past and present wind directions. This study looked at an area near Gill Crater located within the Arabia Quadrangle, an intensely cratered region from 0 – 30 degrees North and 0 – 45 degrees East. This study focuses on comparing wind-shaped surface features to better understand changes in the effect of aeolian processes and wind direction over time. Data from the HiRISE, THEMIS, and CTX instruments were used to examine wind-shaped surface features such as yardangs, sand dunes, and wind streaks in images spanning more than 20 years. The long, narrow yardangs indicate a paleo-wind direction from the northwest and are interpreted to be older in age compared to the wind streaks and dunes. Wind streaks are found in almost every crater and indicate a wind direction from the northeast. Additionally, some wind streaks contain barchan sand dunes that also indicate a wind direction from the northeast. The wind streaks and sand dunes are interpreted to reflect the current wind direction and are evidence that the regional wind direction has shifted over time since the formation of the yardangs. Although no dune movement was observed at the resolution of the images, tracks created by dust devils indicate that aeolian processes are still occurring in this region.

Laser Show Production: How to Balance Entertainment and Education

Sam Hellert, **Zalue Saylee**, **Allison Panek**, **Erin Zeller** and **Steven Shaneyfelt**, GES 495: Laser Show Production Class
Faculty Mentor: Professor Kevin Williams, Earth Sciences
Planetariums are traditionally used to teach astronomy, with equipment able to project the stars, planets, constellations, and other celestial objects onto the hemisphere screen over the audience. With newer digital planetarium systems and software, planetariums can now operate as immersive theaters. They can present topics in sciences outside of astronomy, and they can be used for presentations across other subjects. At Buffalo State's Whitworth Ferguson Planetarium, some examples include helping Earth Sciences students visualize 3D stereographic projection, Art and Design students producing immersive computer animations, and Television and Film Arts students filming and producing an immersive horror movie that was shown in the planetarium. The primary goal of this Laser Show Production class is to understand the importance of entertainment in science education while also focusing on learning how to produce laser music shows and how to safely use the laser system. We have learned how to use the Lasershow Designer QuickShow software to pair laser visuals with music along a timeline. To start, all students added predetermined visuals to Mr. Blue Sky by Electric Light Orchestra. Students then each picked an individual song by the Goo Goo Dolls, a song by the Trans Siberian Orchestra, and a song of their choosing. In this presentation, a laser show will be shown made of one song from each student.

Haute Atelier: An Unconventional Take on Streetwear Fashion

Emelia Seiferth and **Saisruthi Ravishankar**, FTT 358: Fashion Forecasting
Faculty Mentor: Professor Ji Young Lee, Fashion and Textile Technology
Haute Atelier is a contemporary streetwear brand incorporating a modern twist into its design element. Comfortable, carefree, and effortless are the key characteristics Haute Atelier strives to achieve. We target 18-30 aged women who look for a comfortable and tailored fit, composed and relaxed. Inspiration for our seasonal line development was heavily derived from WGSN forecasting Women's key items A/W 21/22 for "Comfy Cardi." This trend embodies textures and ultra-soft styles while maintaining a solid, neutral color palette. Haute Atelier has also followed the A/W 21/22

trend of “Carefree Cinch” from WGSN. The overall mood of this theme represents a feeling of home; a warm, soft feeling that embodies the idea of bringing your home to the street. It blends the spirit of “just rolling out of bed” with composed elements. The mood board features a warm-neutral color palette featuring earthy tones, which aims at creating a comfy and cozy vibe. The designs developed in this collection align with our brand’s concept of juxtaposing traditional streetwear fashion by blending the oversized, loungewear look with tailored, ready to hit the city elements. Breaking the societal norms that come with streetwear fashion through the curation of gender-neutral pieces blended with loungewear elements. Aim to reinvent the traditional oversized silhouette by adding tailored elements to flatter all body types and keeping comfortability at the center by utilizing fabrics such as cotton, wool, and cashmere.

Focus

Zachary Hellwig, Analog and Stop Motion Picture
Faculty Mentor: Professor Yola Monakhov Stockton, Art and Design
Focus integrates analog and digital processes that compose the experimental film, utilizing a variety of techniques. 8mm and 35mm film was used in the creation of the film and it employs stop motion and motion picture, as well as some animation. 8mm film was developed, using hand processing techniques. The film was then digitized and edited using video and photo editing softwares. The project serves as a critical review and response to mental health struggles and emotional turmoil associated with social issues such as waste, pollution, financial hardship, drug reform, environmental uncertainty, privacy, and the condition of local landmarks. This set of issues exist locally in Buffalo and its suburbs but are not limited to any single place. Every positive change carries the weight to lighten the burden on our community. It is important to acknowledge, document and interpret surroundings to cope with feelings of being overwhelmed caused by these issues and enact change to resolve them. A surrealist approach was used to explore these topics because surrealism came after the collective trauma of WW1, relevant as an artistic movement today given the state of division and confusion in a contemporary United States. The significance of the project comes from its subject matter and experimental nature. Integrating film and digital processes, advocates for the education and use of traditional photographic practices while embracing the benefits and versatility of the digital medium.

Eyes Wide Open: The Hotel Industry Has 20/20 Vision

Elizabeth Urmson, HTR 368: Hotel Operations
Faculty Mentor: Professor Kathleen O'Brien, Hospitality and Tourism
There are 132,228 hotels and motels in the US as of 2022, which is 8.3% more than in 2021. About 87% of hoteliers at large and full-service hotels indicated that recent upgrades to their technology capabilities have enabled them to be successful in improving overall guest experience. Our Hotel Operations class participated in three “Hotel Technology Tours” in Spring and Fall of 2022. We had in-person meetings with property managers and toured hotel spaces with attention to the details of modern technology. This observational research method provided me the information needed to categorize examples of modern technologies in use by our local hotel industry today. Students’ reactions to the tour experience will include responses using both pre and post survey data. My findings will answer how modern technologies have changed the way general managers perform their duties based on observations and a review of literature. It was clear to me, there was an elevated level of professionalism among managers who led technology tours, and I saw there was a strong comfort level in the use of technologies. I now realize that hospitality professionals, including hotel managers, need to have essential knowledge of a variety of technologies in addition to skills prior to career placement. Managers should be ready to learn and adapt to the innovative

technologies and have a sharp vision for future innovations to compete in the hotel industry. Eyes wide open with 20/20 vision could lead to success for hotel managers in today's high-tech world!

Effects of RNF4 Interactions with Poly-SUMO Chain Modification Signals on SENP6–Mediated SUMO Chain Disassembly

Samantha Wild and **Suraiya Efa**, BIO 495: POLY-SUMO-2/3 CHAIN
Faculty Mentor: Professor Xiang-Dong "David" Zhang, Biology
Polymeric SUMO-2/3 chain modification of various protein targets regulates accurate chromosome segregation, DNA damage repair, genome stability, stress response, and protein degradation, yet mechanisms in control of poly-SUMO-2/3 chain signals are still poorly understood. Poly-SUMO-2/3 chain signals have been shown to be recognized both the SUMO-targeted ubiquitin E3 ligase RNF4 and the SUMO-specific isopeptidase SENP6 through their corresponding SUMO-interacting motifs (SIMs), in which each SIM includes three or four hydrophobic amino acid residues that directly interact with a SUMO moiety within poly-SUMO-2/3 chain. While RNF4 contains four tandem SIMs within a short 82-amino acid region, SENP6 comprises seven SIMs that are separated far away from each other within a long 500-amino acid region. In addition, our preliminary results showed that overexpression of GFP-tagged RNF4 fragment with four SIMs greatly increases levels of poly-SUMO-2/3 chain-modified proteins in human cells. Therefore, we hypothesized that compared to SENP6, RNF4 interacts more tightly with poly-SUMO-2/3 chain signals and therefore inhibits SENP6-mediated chain disassembly. We are currently testing this hypothesis by first synthesizing and purifying poly-SUMO-2 chains followed by incubation with His-tagged RNF4 fragments containing wild-type SIMs or inactive SIMs dead mutant in the presence of immunopurified GFP-tagged SENP6 for a time course.

Riot! A Deep Dive into Stravinsky's Ballet The Rite of Spring

Lucas Diermyer, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Igor Stravinsky was among the most renowned composers of the 20th century. My project focuses on one of his most famous works, Le sacre du printemps [The Rite of Spring], which experienced a very controversial reaction at its 1913 world premiere in Paris. At this point in his musical career, Stravinsky had composed two other famous ballets: Firebird (1910) and Petrushka (1911). Going into the Rite of Spring with these precedents, Stravinsky had fully encompassed musical elements of his compositional predecessors. At its premiere, specifically the final movement "The Sacrificial Dance" which I analyze in greater depth, Sacre (which is set in pagan Russia) was considered extremely experimental, utilizing many uncommon metrical patterns and having a very dissonant overall sound. During this concluding episode in the ballet, a vestal virgin is chosen to dance herself to death as a sacrifice to the gods. The concept of death is represented in the composition through dissonant counterpoint. With sporadic solos spread throughout many different orchestral instruments, Stravinsky's colorful texture gives the final movement a very chaotic feel. As a percussionist, I find that this music was one of the first examples of flavorful percussion parts, and its wide international influence directly changed the course of musical modernism to the present day.

Characterization of Heavy Metals in the Soil of Buffalo's East Side

Cooper Axelrod, **Devonte Brown** and **Grace Brzykcy**, ENS 300: Environmental Case Studies
Faculty Mentor: Professor Elisa Bergslien, Earth Sciences
Lead and other heavy metals can be found in soil as remnants from industry, leaded gasoline, and lead used in paint before 1978. High concentrations of lead and heavy metals such as zinc and arsenic in the soil can cause adverse health effects in humans, especially children. Communities in the East Side of Buffalo would like to create urban gardens but are concerned that high levels of lead and other such contaminants in the soil may inhibit their ability to do so. There are several sites on the East Side of Buffalo where soil samples will be collected and analyzed using x-ray fluorescence spectroscopy. XRF is an analytical technique used to determine the elemental composition of a given material. These results will be compared to New York State Department of Environmental Conservation (DEC) soil cleanup objectives, U.S. EPA issued guidelines, and recommended levels according to best practices for urban gardens. The results of this study will also be used in conjunction with demographic and historic data of the East Side of Buffalo to evaluate any patterns of contamination. We expect lead and heavy metal concentrations in the soil to be higher on the East Side of Buffalo than in the Olmsted Park systems soils. Construction on the Olmsted Parks begun in 1870, so these areas do not have a history of heavy industry and should be indicative of regional background levels.

The Creation of the FDA and the Importance of Food Safety

Melvin Scott, HIS 300: Research and Writing Seminar
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
Nineteenth century food safety and quality in the United States was a considerable problem. As a result, the United States government passed the Pure Food and Drug Act in 1906, which created the FDA. This paper will examine how deleterious the food quality was in the nineteenth century. These conditions include: the chemicals or substances that were in food that made it deadly for the average consumer, the rotten or diseased conditions of products on store shelves that went unregulated, and the sickness and disease caused from consuming the food, including the deaths of consumers. Evidence to support these claims will include government documents, articles, and books from the nineteenth century. This paper will use all of these methods to show the importance of the FDA. Despite resistance from companies and the lobbied members of the government, the FDA began to enforce laws governing food and regulated it in the United States. These rules and regulations would make food safe for the consumer, by banning dangerous chemicals and enforcing safer methods to preserve foods.

Re-Imagining Coca-Cola: The Pepsi Challenge and the Failure of New Coke

Zachary Pieczynski, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
In 1975 the Pepsi Challenge was introduced. Consisting blind taste testing Pepsi and Coca-Cola to see which people would choose, the majority of people choose Pepsi over Coke. The Coca-Cola Company scrambled to try to find a way to respond to the Pepsi challenge. Their response was

New Coke; a brand-new product that was designed to compete with Pepsi. New Coke was the product seen by Coca-Cola executives as the way to revive the brand and become a viable alternative able to beat Pepsi as the most loved soft drink in the United States. New Coke was perceived by loyal Coca-Cola consumers as a betrayal. Coke consumers loved Coke with a passion, and for the company to get rid of the original formula was not well received by the general population. As a result, Coke drinkers revolted as reported in multiple New York Times articles. In an interview with Coca-Cola CEO Robert Goizueta, he goes in-depth about New Coke and how the Introduction of the product went. This project is going to be about the process that led Coca-Cola to pay a high price for not paying attention to its loyal customers in the mid-1980s. Changing the flavor of Coke was not necessarily the right move when trying to compete with Pepsi. Researching why New Coke failed is important to understand consumerism in the mid-1980s.

From Ada Boni to the Olive Garden: The Americanization of Italian Food in the United States, 1950-2000

Jacob Fuqua, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This research project narrates the origins of Italian cuisine and details the evolution of Italian ethnic food in the United States from 1950-2000. This paper will argue that recipes from the famous Italian Chef Ada Boni and others like Marcella Hazan, author of Marcella's Italian Kitchen from the 1950s, changed in construction and composition to the 1950s. The research explores the questions about classic Italian dishes. To achieve this goal, the study will answer questions such as: What changes were made over time? As well as where these meals originated from. The research used for this paper includes recipes from Ada Boni's Talisman Italian cookbook, comparing them with recipes from the popular restaurant chain Olive Garden detailing the changes and evolution of dishes. Boni's Talisman Italian Cookbook is a compilation of 2,000 Italian recipes published in 1954. The paper will discuss the most popular Italian cook of her time, including dishes like spaghetti with and without meat, Neapolitan and "Old style" Lasagne, and desserts like Zeppole. Conclusions of this research will be drawn from the difference in the preparation of these meals and contrasting ingredients to understand the economic and cultural differences in a food system.

Getting Canned: The American Canned Food Industry during the 1900s to 1920s

Desire Tubbins, HIS 300: Research and Writing Seminar
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This project will discuss the history of the canned food industry from the years 1900-1920 and answering the question: what effect did this industry have on the American society. I will be focusing on canned meat, due to canned meat being a new revolutionary idea as well as controversial. Canned meat specifically is my choice because of how hard it is to make meat shelf stable and fit for consumption. This was important because of World War I and the effects the canned food industry had on feeding the soldiers and more food options thanks to canning. The canned food industry changed the orientation of the food industry as well as society when canned food became widely available. This study will demonstrate my points and conclusions by using primary sources such as advertisements from canned food companies that will show how the industry affected people's view on canned food. I will use this data collected to show how the canned food industry affected society during the early 1900s.

Brain, Soul, and Spirit: From the Holodomor to the Russia-Ukraine War

Anne-Sophie Hellman, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This paper will examine the Holodomor – a genocidal famine perpetrated by the Soviet Union against Ukraine between 1932-1933 – through the perspective of the Russia-Ukraine war. The Holodomor is significant to the legal history of the word 'genocide,' the discourse surrounding its formal definition, and its application within international criminal law. Raphael Lemkin, the lawyer who created the term 'genocide,' describes the Holodomor as "the classic example of Soviet genocide" in his speech "Soviet Genocide in the Ukraine" (1953) due to attacks against Ukraine's intellectuals, churches, farmers, and population. The loss of Ukrainian social institutions during this period negatively affected contemporary Ukrainian society – creating public sentiments of distrust, weakness, and corruption. This paper will explore how the election of Volodymyr Zelenskyy in 2019 and the Russia-Ukraine war in 2022 impacted Ukrainian perceptions toward the state, national identity, and politicians. The fear of losing Ukraine to the West and its perceived threat against Russian interests has remained in Russia since the Holodomor. Russia continues to use militarism to undermine Ukraine's sovereignty and quell rebellion as it did in 1932. This paper will examine how the history of the Holodomor, and the period in between, can inform our understanding of the present war. Upholding Anne Applebaum's research in Red Famine: Stalin's War on Ukraine (2017), the Holodomor resulted from requisitions, blocklists, border control, de-Ukrainization, information blockades, and food searches. This paper will explore these actions – including dekulakization and collectivization – and their consequences using primary sources from speeches, memoirs, oral testimonies, and newspaper articles.

From Exotic to Mainstream: An Historical Overview of Sushi in America

Zachary Wier, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
This research project examines the history and transformation of sushi in America. The research question being investigated is: how the perception and consumption of sushi in America has changed over time? Sushi has become an integral part of American culinary culture, but its history and transformation in the United States still need to be better understood. A mixed-methods approach is used to address this gap, including a literature review to provide background information on the history of sushi in America and a recipe comparison reflecting on the cultural and economic factors that have shaped its evolution. Preliminary observations suggest that sushi has significantly changed in America since its introduction in the early 1900s. Initially seen as an exotic and unfamiliar food, sushi has become a mainstream delicacy, with a diverse range of regional and fusion variations catering to American tastes and preferences. The emergence of fast-food sushi chains and the integration of sushi into American pop culture have also contributed to its growth in popularity. The final findings of this project will provide a detailed analysis of the history and evolution of sushi in America, highlighting the cultural, economic, and social factors that have shaped its development over time. The project will be presented as a talk alongside a poster, describing the project's significance, methodology, and key findings.

Manganese Oxides for Selective Oxidation Reactions: Stoichiometric vs Catalytic

Jonathan Grant, Chemistry
Faculty Mentor: Professor Sourav Biswas, Chemistry
Manganese oxides are prevalent materials for catalyzing selective oxidation reactions, stemming from their affordability and performance. The catalytic properties of manganese oxides are strongly related to the easily tunable redox properties due to easily exchangeable multiple oxidation states of Mn and their oxygen reducing ability. However, to obtain reasonable performance, a stoichiometric (could range anywhere from 2 times to 5 times the amount of the reactants) amount of commercially available manganese oxides is often required for selective oxidation reactions. In this study, we synthesize different structural forms of manganese oxides by sol-gel redox process and identify the potential catalytic Mn oxide materials for selective oxidation reactions. Our major focus is on OMS (octahedral molecular sieves) series of manganese oxides, which have been known to be prepared in various structural forms with tunable physicochemical properties. Selective oxidation of benzoyl alcohol to benzaldehyde is used as a probe reaction with potential expansion to oxidative C-H functionalization.

Ackee and Saltfish from Slave Food to National Dish in Jamaica

Rashad Panton, HIS 300
Faculty Mentor: Professor Bridget Chesterton, History and Social Studies Education
The question here is how did the Jamaican dish Ackee and Saltfish come to be a national dish? Ackee and Saltfish is the national dish of Jamaica, and it was not always like that. Previously the dish was a cheap way to feed slaves. The ackee itself is a fruit from Africa and saltfish used to be salted cod. But since overfishing has now made cod hard to obtain, any kind of fish is subsitituted. The answer to the question above is that people were so used to it and popular it just slid into the culture of Jamaica. The way I collected information was by looking for books by professors who were knowledgeable on the topic also looking at databases for articles that looked at economic successes with the dish and even how it ingrained itself in the culture. In my talks I intend to provide a brief history of the dish and then how it has evolved since the creation of the dish and how the people from both Jamaica and outside of the country view the dish.

The Panel Analysis of Buffalo State University's Decreased Enrollment

Tatiana Shaddi, AMT 495: Applied Mathematics Project
Faculty Mentor: Professor Bruce Swan, Mathematics
The purpose of this project is to investigate the decline of students' enrollment at Buffalo State College, renamed as Buffalo State University, the reasons behind the cause of the decline, and how this affects the school financially. I will collect and investigate some fundamental students' demographic data, including self-identifying demographics, family income, locations and local unemployment rates to find whether and how these factors impact college enrollment. These results will be compared to freshman college interest rates, and freshman college exposure which will reveal whether students are interested in pursuing higher education. The findings thus far from this research suggest that college interest for students has declined across the US Country

influencing the enrollment decline. The conclusion of this paper will provide suggestions on ways Buffalo State University can influence High School Students and inspire them to want to pursue higher education.

Characterization of Silver Nanoparticle Aggregates Using Raman and UV-Vis spectroscopy

Kayla Issurdatt, FOR 495
Faculty Mentor: Professor Jinseok Heo, Chemistry
Here we report the characteristics of citrate-capped silver nanoparticle (AgNP) aggregates prepared using quick freezing. A solution containing citrate-capped AgNPs with an average diameter of 70 nm was frozen in liquid nitrogen and thawed at room temperature. The quick-freezing method produced AgNP aggregates termed as QFISAs. The QFISAs were stable for more than a month if stored in a refrigerator. Our previous study showed that freezing-induced Au nanoparticle aggregates (QFIAAs) could be used as surface-enhanced Raman scattering (SERS) substrates in the near-IR (NIR) region. The spectroscopic properties of QFISA were examined using UV-Vis spectroscopy and Raman spectroscopy. Compared to unfrozen AgNPs, the QFISAs showed a shift in the plasmon absorption wavelength from 445 nm to 443 nm and an increase in the absorption in the near-IR (NIR) region. The blue shift of the plasmon absorption suggests a decrease in the size of AgNPs, and the appearance of an extended plasmon band in the NIR region indicates the presence of the freezing-induced AgNP aggregates. The Raman study revealed that the SERS activity of QFISAs is more dominant with a 532 nm laser excitation than with a 780 nm laser excitation, suggesting that the QFISA is a better SERS platform in the visible region than in the NIR region unlike QFIAAs. Nile Bule A dyes could be detected at the nanomolar concentration level using QFISAs as SERS substrate. This study shows that QFISAs can be potentially a good platform for the detection of analytes using the SERS in the visible region.

Green Oxidative Deprotection of Hydrazones and Oximes by Mesoporous Manganese Oxides

Michael Vullo, Chemistry
Faculty Mentor: Professor Sourav Biswas, Chemistry
The protection-deprotection of organic functional group is a popular technique in the preparation of complex organic molecules allowing the temporary masking of functional groups, followed by selective production of the target molecule. Traditionally, the deprotection reactions are performed using mineral acids and bases, which is a concern in terms of environment hazards and stability of the functional groups. Heterogeneous catalysts have been utilized in the field of protective groups chemistry due to the feasibility of environmentally friendly methods of preparing organic compounds along with improvement of selectivity. Many reported heterogeneous catalytic routes involve the use of stoichiometric toxic oxidants and hazardous peroxides. Herein we used mesoporous manganese oxide nanomaterials for the deprotection of hydrazone and oxime derivatives to corresponding carbonyl functional groups using aerobic and mild reaction conditions. The materials are synthesized by evaporation induced self-assembly method and composed of aggregated nanoparticles with a mesoporous network. Both hydrazone and oxime derivates are converted to corresponding carbonyl compounds with excellent selectivity. Mechanistic study revealed involvement of radical intermediates by electrons transfer to Manganese centers followed by oxygen activation. Mild reaction conditions, absence of any acids and bases and use of air as the sole oxidant make our catalytic protocol greener and attractive for oxidative deprotection chemistry.

Mahler at the Metropolitan: First-Person Testimony

Gabriella Colton, MUS 303: Music History 2
Faculty Mentors: Professor Carolyn Guzski, Music and Professor Amy McMillan, MAH Honors Program
My research explores Gustav Mahler's (1860-1911) tenure as conductor at the Metropolitan Opera. Not only a leading composer of his day, Mahler also served as an innovative conductor, and served for a brief but brilliant period at the Metropolitan Opera from 1908-1910. Cut short by a serious heart condition that ultimately proved fatal, Mahler's abbreviated tenure nonetheless allowed him to cross paths with fellow Czech artist Ottokar Barik (1868-1936), whose letters contribute significant primary-source evidence to this era in American operatic history. Bartik served at the Metropolitan Opera from 1909-1929 as a dancer and choreographer. The opera that connects these two artists is the Met's premiere of Prodaná nevěsta [The Bartered Bride] (1866), composed by Bohemian nationalist composer Bedrich Smetana. This was Bartik's debut as both dancer and choreographer at the Metropolitan, and despite the career instability he was then experiencing (as his letters demonstrate), he achieved unprecedented artistic results. Bartik engaged twelve Czech couples to join the Metropolitan ballet corps as "authentic" performers in the folk-dance scenes that are central to the operatic narrative. Mahler fully supported this innovative move and his interaction with Bartik on the situation is described in the letters. The risk that Bartik took in introducing talented amateurs was a huge success. This encouraged him to repeat the strategy in subsequent Met productions, first with Russian dancers and then, most significantly, with African American male dancers in the ballet The Dance in Place Congo by Boston composer Henry F. Gilbert (1918). These letters reveal the inception of an important performance initiative that led to unexpectedly pathbreaking results.

Serene Futurism

Alexis Remington, FTT 451: Senior Collection
Faculty Mentor: Professor Ali Eagen, Fashion and Textile Technology
Inspiration for this collection came from water and nature around water. The WGSN articles that inspiration came from were "Serene Futurism - Womenswear Forecast S/S 24: SenseScapes" and "Serene Futurism - Intimates Forecast S/S 24: SenseScapes". SenseScapes focuses on smooth silky textures and featherweight sheers. The Intimates forecast focused on supremely fine, feminine, and non-floral laces that are inspired by natural elements such as woodgrain and animal markings. Around water, I have feelings of fluidity and joy, but also a deep sense of fear and panic. Water can be beautiful or destructive, calm or violent, silent or raging. I wanted to evoke those feelings in my collection. I want to tap into those feelings to create a collection that really speaks volumes to people and can be interpreted in different ways. This collection and inspiration relate to Provoking Protopia because water is life. Without clean and safe water, there is no way for life to continue. I will use this platform to promote the protection of our water and keep it free of plastics and chemicals. "What's Wrong with the Fashion Industry" by Sustain your Style shows the impact the fashion industry has on our waterways. Approximately 20% of industrial water pollution comes from textile treatment and dyes. 2.6 percent of our global fresh water is used to produce cotton alone. To produce one shirt and pair of pants, it takes approximately 20,000 liters of water. Water consumption and pollution is one of the worst impacts on the environment of the fashion industry. It is my hope to inspire change for consumers and other designers.

Land of 10,000 Lines: An Examination of Sean Daley's Songwriting

Nolan Hagen, SPC 321: Rhetorical Criticism
Faculty Mentor: Professor Ann Liao, Communication
Minnesota is home to a lot of unique things. Such include a bevy of lakes, the Twin Cities, and a stagnant hockey culture. What most people don't associate with the area is it being a breeding ground for hip-hop music. Though never acquiring much mainstream recognition, the record label Rhymesayers has produced a solid foundation of insightful music from its birthplace in Minneapolis for the better part of the past three decades. Founding members Sean Daley and Anthony Davis started their own group called Atmosphere in 1997. The duo has toiled with a litany of sonicism and storytelling throughout their 26-year span in discography. The focus of this presentation will mostly be within Daley--moniker Slug's songwriting, with recognition to what Davis (aka Ant) provides musically as a compliment. This will be done using elements of rhetorical criticism in analysis of topics such as ideas, cultural criticism and argumentation. This group has been my artifact of reference throughout the semester as I've covered a handful of songs. Each song deals with a different topic that can be condensed into a few minutes of rich consumption. The songs I have analyzed vary in both emotion and insight. I chose this group as my artifact and basis of presentation because they cover so much within amateur psychology in a manner that is deep yet digestible. A common theme within their cultural quasi-journalism is that they discuss mainly the underbelly of American life in the Midwest.

Social Media Use, ADHD and Academic Performance

Jennifer Mitsuyama Brandenberger, **Alexis Bilotta** and **Dania Abdulrahman**, PSY 488
Faculty Mentors: Professor Howard Reid, Psychology and Professor Kimberly Kamper-DeMarco, Psychology
The advancement of technology has resulted in widespread social media access. People of younger and younger ages are going online regularly. Alongside this phenomenon the rates of ADHD symptoms have risen dramatically. Social media was designed to be addictive and capture attention. Those with ADHD symptoms tend to use social media at greater rates as well as show more problematic behavior regarding social media use. Currently there is little research examining the role self-regulation plays in ADHD symptoms, social media usage and educational success. The current study aims to fill the gap by investigating educational success, social media use, self-regulation and ADHD symptoms in Buffalo State University students. It is hypothesized that problematic social media use and GPA are mediated by self-regulation. It is also hypothesized that lower self-regulation and high social media usage would be linked to lower GPA. Participants were recruited through an announcement to psychology professors who then shared the announcement with their classes. Participants were asked to complete questionnaires regarding social media disorder use, strategies for learning, academic motivation, and ADHD. The expected results are that self-regulation mediates the relationship between social media usage and GPA, and that self-regulation is negatively correlated with ADHD symptoms. In conclusion this research will provide groundwork for future studies to investigate the link between self-regulation, social media usage, GPA and ADHD.

Biblical Bernstein: Theological Meaning in Leonard Bernstein's Symphonic Works

Aneris Rivera-Wagner, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Leonard Bernstein (1918-1990) garnered acclaim during the mid-20th century as one of America's greatest conductors and music educators. He also enjoyed great success as a composer, most

notably for his legendary collaboration with Stephen Sondheim on West Side Story (1957). That being said, Bernstein explored the possibilities of many different genres. Over the course of his extensive career, Bernstein wrote three symphonies: Symphony No. 1: Jeremiah; Symphony No. 2: The Age of Anxiety; and Symphony No. 3: Kaddish. Inspired by his idol, the Austrian late-Romantic composer-conductor Gustav Mahler, one of the most prevalent aspects of Bernstein's symphonies is their strong connections to faith, particularly Judaism. My project explores and identifies the ways in which Bernstein's faith permeated his prolific career by juxtaposing his first symphony with his last. The fusion of Judaism and the symphonic genre was a concept ruminating in Bernstein's mind dating back to his compositional origins. As a Harvard undergraduate in 1939, Bernstein's sketches of a "Hebrew song" for soprano and orchestra began to take shape, later transformed into the third movement of Symphony No. 1: Jeremiah. Two decades later--his career now well established--Bernstein premiered Symphony No. 3: Kaddish, based on the ancient Jewish prayer sequence regularly recited in the synagogue service. In the words of the maestro himself: "Obviously, the biblical thing interested me. I mean I keep coming back to it ... something keeps making me go back to that book."

Understanding the Historic Timeline of Segregation in Buffalo, New York

Jamie Bommer, **Kelley Hoffman**, **Angela Nye**, **Widelson Orsel** and **Caitlyn Parsons**, ENS 300: Environmental Case Studies
Faculty Mentor: Professor Elisa Bergslien, Earth Sciences
Buffalo is considered to be one of the most racially segregated cities in the United States. Substantial research has been conducted investigating the racial segregation in the city and shows that 85 percent of the Black population lives on the East Side of Main Street. The dominant explanation for this occurrence has been linked to historically discriminatory lending policies, such as redlining, which led in turn to neighborhood succession, disinvestment, and eventually resulted in concentrated poverty and racial segregation in certain areas. However, there remains a gap in research regarding other forms of segregation and disparities that may be present throughout the city, such as environmental exposures. This paper seeks to identify potentially segregated or highly concentrated demographics related to health, economics, land use, and infrastructure. Through the development of a timeline using historical data, we will be able to establish a reference of how and when these patterns began to emerge. We expect to find spatial relationships between demographic trends related to these various forms of segregation. This data will also be related to contemporary heavy metals analysis of soil in the East Side. Our findings will be presented in a poster presentation which will include historic timelines and spatial data displayed in maps.

Life's a Beach: RUNWAY Collection

Imani Wint, FTT 451: Senior Collection
Faculty Mentor: Professor Alexandra Eagen, Fashion and Textile Technology
Provoking Protopias is all about building an attainable future. It's safe to say that most of us envision a utopia- a perfect world with no problems. However, that isn't feasible since there will always be problems both in and out of mankind's control. It's what we chose to do in preparation and in the aftermath of these issues that can lead us to a protopian society. To me, protopias aren't attainable unless we remember where we came from, and that is what this collection represents. We learn from what we have done, from what we know and we build up from there. My collection pays homage to the past by combining the old and the new with designs and raw materials, thus aiding in the fight for a more sustainable society. Sustainability is a key factor in the development of

this collection because it encourages reducing wastefulness and it also forces you to be creative with your designs. Based on CalPrig, 85 percent of our clothes end up in landfills and the average American throws away about 81 pounds of clothing every year. Within the mass of thrown-away clothing, 60 percent of the clothes are non-recyclable. Understanding the wastefulness of the fashion industry inspires me as a designer to make clothing that has longevity, as well as clothing that can either be recycled. My designs are centralized around a minimal amount of new fabrics that are all natural, combined with remnant crochet projects that my mother made. I want my designs to make a lasting impression and to show people, both designers and consumers the importance of shopping and creating sustainable fashion. I will show this to the audience by documenting the process of construction, as well as facts surrounding the importance of renewable fashion.

How a Planimeter Works

Capri Webster, MAT 491: Capstone Research
Faculty Mentor: Professor Robin Sanders, Mathematics
The planimeter, a simple yet complex instrument, is one of the most intriguing tools to be created and perfected by several mathematicians. It is a tool that is used mainly by engineers and surveyors to measure the area of an irregular region. Conceptualized by a land surveyor, J. M. Hermann, then later improved by mathematician Jakob Amsler-Laffon, the planimeter uses geometry along with Green's Theorem to integrate a line integral of a field which has a constant curl. I will use the mathematical components from Green's Theorem to show how the integral of the circulation about a closed curve C can then be modified to find the area of the region inside of C. Green's Theorem is a well-known theorem from vector calculus that relates the line integral of a vector field with functions that that have continuous partial derivatives to a particular double integral over the region enclosed by the curve. As there are several different versions of a planimeter, I will expand on one or two of them in more detail. You will see how all the components of the planimeter plays a part in obtaining the area while observing how it translates the math so efficiently.

Effect of Race and Emotion on Perceived Sexual Assault Credibility

Jamie Ervolina, Psychology
Faculty Mentor: Professor Eyad Naseralla, Psychology
When a woman is the victim of rape, the way her credibility is perceived can be based on her expressed emotions, as rape is believed to result in an intense level of emotions. Additionally, there are racial stereotypes related to emotion, such as stereotypes of black women as angry. The purpose of this study is to examine the effects of stereotypes of emotional expressions on credibility in black and white rape victims. A total of one hundred and fifty participants will be recruited via Amazon mTurk. Participants will be asked to read a court transcript of a victim's testimony. The victim will either be described as black or white and will be described as emotionally neutral or angry. Subsequently, the participants will complete a scale of how credible they believe the victim to be. We hypothesize that the victims who will express more anger will be seen as more credible than emotionally neutral victims, and that this will be found stronger for black women. These possible findings would suggest that the emotions of women and their race are both perceived in determining the victim's credibility. Therefore, if the credibility is based on the victim's race, then that would lead to the indication that a woman's credibility is influenced by racial stereotypes.

Monitoring Hurricanes Using National Oceanic and Atmospheric Administration (NOAA) Data

Chelsie Mckinnie, Earth Science
Faculty Mentor: Professor Elisa Bergslien, Earth Sciences
Global warming means that ocean temperatures are higher, providing more energy for storm systems like hurricanes. This could potentially impact the number of storms and/or the intensity of those storms, as well as their timing and track. For this project, the area of study is the Atlantic Ocean, and the south-eastern coastal areas of the United States, and seeing how those temperatures affect the intensity and timing of hurricanes in this area. The hurricanes evaluated include Hurricane Ida (2021) and Hurricane Nicole (2022). Both events were billion-dollar disasters, dealing massive amounts of damage, but occurred during different times of the Atlantic Hurricane season. My research involved constructing a map of the Atlantic Ocean for each hurricane and making sections to determine the temperature of the ocean during each of the specified events. This included looking into each hurricane, their intensity, duration, track, and the damage that followed. By comparing each hurricane to the temperature of the ocean during that time, I was able to determine that an increase in temperature, even during the end of hurricane season, highly influences the longevity and strength of the hurricanes studied.

Not For Your Aesthetic Pleasure: Alban Berg's Wozzeck

Nathan Reiser, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
The Modernist opera Wozzeck, op. 7 (1925) by Alban Berg (1885-1935) was extraordinarily influential for its time. The opera is unique in that it features an atonal sound palette, heard particularly through Berg's masterful polyphonic technique, where instruments play in dissonant counterpoint with each other. Composers of the early Modernist period began to adopt this style more frequently, in part because they believed it to be "cutting-edge" among artists and intellectuals in society. The new aesthetic led to the 2nd Vienna School, with genius composers such as Schoenberg and Webern subsequently developing a more mathematically precise 12-tone technique. Wozzeck unfortunately did not spread immediately throughout the international musical world, mainly because many incorrectly believed it to be influenced by the Nazi regime. Through its scenic depictions of soldiers in military camps against an emotional background of anxiety and insanity, it was not difficult for the public to form this conclusion. The opera makes for searing viewing because the plot depicts the mentally unstable soldier Wozzeck, who descends into insanity and kills his allegedly promiscuous wife. In particular, I examine the opera’s intriguing Act 2, Scene 5, where Wozzeck finds himself in the barracks with the Drum Major, who flaunts his masculinity despite Wozzeck's obvious mental instability. As part of an overarching scheme of Classical structures, Berg uses a Rondo form here to form vivid contrasts between episodes featuring the Drum Major's singing to minimal instrumentation, alternating with refrains played by the entire orchestra. The absence of tonal center inherent to atonality expresses Wozzeck’s mental condition with great expression. Similar to the classic horror genre in film, Wozzeck’s aggressively Modernist style creates a powerful impression which demonstrates that music does not always have to be beautiful to be appreciated.

Bel Canto Vocalism & The Italian Swan

Julia Kuk, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Romanticism in vocal music was influenced by two Italian composers, Vincenzo Belllini (1801-1835), known as “The Swan”, and Stefano Donaudy (1875-1925). The public raved of their exceptionally long-lined melodies (known as "cantilena") that had not been heard before, and of their uncanny ability to match music with poetry. Bellini had composed over thirty operas, but near the end of his career his art songs became overshadowed by this genre. Bellini’s “Dolente Immagine de Fille Mia” examines grief after a loved one is lost. Donaudy’s “O Del mio Amato ben” was inspired by the mature sensual Romantic style of the 19th century that also incorporates Baroque techniques, giving the listener a feeling of passionate urgency. Both include written-out melodic embellishments that sound spontaneous and are integrated into the overall musical texture. I explore the bel canto vocal style that governs both compositions, including musical components that reflect this era. Bellini set the precedent for art songs of the future--significantly French melodie and German Lieder--that influenced Donaudy as well.

Ladder of Creation: Mahler’s Symphony No. 3 and Artistic Spirituality

Alexa Wery, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
Gustav Mahler's (1860-1911) Third Symphony honors Beethoven while departing from symphonic tradition. Mahler was an important conductor by trade who found solace in musical creation. He would retreat during the summer months to compose, and elements of nature are heard throughout this work, including in this masterpiece. The Symphony no. 3 is atypically cast in six movements, with two additional movements beyond the typical genre, inspired by Friedrich Nietzsche’s Also sprach Zarathustra and the folk collection Des Knaben Wunderhorn. Mahler bridged the gap between 19th-century Romantic traditions and the inception of 20th-century Modernism, respecting the Classical template while freely departing from it with great creativity. Mahler’s fourth and fifth movements unusually include solo and choral singers, as Beethoven did in his Symphony no. 9; there are also elements of other late Romantic composers such as Bruckner. My research draws connections among Mahler’s nine other symphonies (his tenth remains unfinished), making it eclectic as a whole. Because the movements are not clearly contrasting, intellectual knowledge has to offset the music’s chaotic nature with the ethos it expresses throughout. The temporal process is one that doesn’t fully emerge until the finale. Only then does it become clear that Mahler has created stages of an evolution--from nature to the love of God--representing artistic spirituality. This programmatic symphony may be open to personal interpretation, considering its ambiguity. The musical narrative, however, is completely Mahler's own.

The Appropriation & Misrepresentation of the African American Culture

Madison Bryant-Wagstaff, FTT 450: Global Issues in Fashion and Textile Industry
Faculty Mentor: Professor Arlesa Shephard, Fashion and Textile Technology
African American culture has been victimized on numerous occasions, dating back to the beginning of time. During the 15th century, the Trans-Atlantic slave trade introduced the victimization of African Americans being that slavery initially was not based on race but rather viewed as a sole part of the trade. Even though slavery was abolished in the United States with the passing of the 13th Amendment on January 31, 1865, this was only the beginning of the systematic oppression African Americans would face for centuries in America. As a result, the African American community has

been viewed negatively by white Americans as the following stereotypes: ghetto, inferior, etc. Despite their history of victimization, their culture is the backbone of American culture. For example, their use of innovation to navigate through systematic oppression through fashion trends. This creates a dramatic irony, resulting in numerous cases of cultural appropriation primarily found within the fashion industry. Hence, Naresha Willis adopted the phrase, “Ghetto until proven fashionable” for her brand AVNU. With efforts to combat the systematic oppression that African Americans face daily living in America, Black Lives Matter was established. My research will be presented as an oral presentation with a supporting PowerPoint, which is based on the following research question: To what extent does the issue of cultural appropriation of the African American community found within the fashion industry, support (relate to) the mission of the Black Lives Matter movement in relation to Naresha Willis’s coined phrase, “Ghetto until proven fashionable”?

The Color of Water: Images from Nature in Piano Music of Debussy and Ravel

Mikayla Manke, MUS 303: Music History 2
Faculty Mentor: Professor Carolyn Guzski, Music
In the late nineteenth century, the art of Impressionism was born. Its purpose was to capture images of nature and people through the impressions of human emotion. Painters like Claude Monet and Pierre-Auguste Renoir broke free of conventional technicality and used broad brush strokes, experimenting with light and color to create the illusion of motion. At the inception of this art movement, late Romantic music had reached its apex. French composers Claude Debussy (1862-1918) and Maurice Ravel (1875-1937) brought the Impressionistic style into music to counter the Romantic movement. Their piano compositions—specifically those dealing with images of water—experimented with capturing nuanced feelings and the distinct ambience of images from nature. Flowing melody lines, long arpeggiated harmonies, freely moving rhythm, and colorful chords born outside the rules of classical harmonic practice, were all used to achieve this. The goal of my research is to show the important connection between visual art and music, Debussy’s and Ravel’s unique takes on the genre of Impressionism, and how French and Japanese art had an impact on the ideals of this era in music history. I discuss Impressionistic art connections to the music of both composers, specifically the themes of water in Debussy’s Reflets dans l’eau [Reflections on the water] (1905) and Poissons d’Or [Goldfish] (1908), as well as Ravel’s Une barque sur l’ocean [A boat on the ocean] (1906).

The Number e

Jacob Haskell, MAT 491
Faculty Mentor: Professor Robin Sanders, Mathematics
For my research project, I have chosen to write about the definition of the number e and proofs of some of the basic limits that converge to e. The number e is a mathematical constant, often referred to as Euler’s Constant, that is the base of the natural log. I will first discuss the creation of the concept of e and its origin. Then, I will view the history and evolution of e, looking at how other mathematicians added to and further refined e as a number. After that, I will go in-depth on some proofs of how to calculate e. Some examples of these proofs are an infinite series of 1/(k!) and a limit of n/(n!)^(1/n). To conclude my presentation, I will go further with the concept of e and display some intriguing proofs revolving around e, showing some of its useful applications as well as some general theorems involving e.

Belle Chic's Midnight Blues Is a Collection That Every Woman Needs to Be Talking About

Julia Jugoon and **Kayeelah Ephraim**, FTT 358: Fashion Forecasting
Faculty Mentor: Professor Ji Young Lee, Fashion and Textile Technology
The Seasonal Line Development is a project in the FTT 358 Fashion Forecasting class where we created an apparel product line for our luxury couture gown brand called Belle Chic. We created a F/W 2023 with a theme of Midnight Blues for this project, which includes branding, consumer targeting, trend analysis, forecasting, and our design development. For branding, our luxury couture company provides gowns (ranged sizes 2-18), shoes, and accessories. Our pricing ranges from $100-$20,000 with the couture gowns in the higher price range. Our target consumers are ladies who live in the city and love to attend elaborate galas for work. For our trend analysis, we looked at the 2022 runways and evaluated Chanel, Dior, and Alberta Ferretti which were all providing "Vintage Glamour" collections. As we looked to forecast for the F/W 2023 season, we chose floral accents with a color palette of light and dark blues that create an aesthetic contrast. Our theme focused on "midnight blues" which creates a feeling of royalty and fairytale imagination which we tried to incorporate into our design development. We created a ballgown made of silk charmeuse with a dark blue tulle overlay. The second gown is a princess silhouette made of bridal satin with a silk organza train attached at the waist. Our third look was an a-line gown made of matte satin with a lace waistband. Our goal for this collection is to make each woman feel confident in each gown with flattering blueish colors and silhouettes.

Muscle Dysmorphia, Eating Disorders, & Orthorexia: Possibly One Diagnosis

Natasha Renczkowski, Psychology
Faculty Mentors: Professor Jill Norvilitis, Psychology, Professor Jean DiPirro, Psychology and Professor Naomi McKay, Psychology
Men are often overlooked when talking about eating disorders, even though they are affected by them. Muscle dysmorphia is a disorder that is characterized by an individual not seeing themself as muscular enough to the point where it causes functional impairment. This study looked at the relationship between eating disorders, muscle dysmorphia, and orthorexia, or more specifically, diet. The strongest set of predictive items were identified through reliability analysis to create a new scale labeled as the Muscle Dysmorphia and Eating Disorder Scale (MDED). The correlations between the new scale and the other measures were assessed to demonstrate that the new scale was a better representation of men's symptoms. This study showed that all three of these disorders are related to one another, so it may be important to consider the idea of these three being one syndrome instead of different related conditions, also while considering correlates such as anxiety and depression.

Do I Love You or Do I Love Us?

Daniel Guercio, PHI 308 Philosophy of Love and Sex
Faculty Mentor: Professor John Draeger, Philosophy
Do I love you for you or do I love you for us? This paper explores the nature of romantic love which shares aspects of familial and friendship love. This nature of love can be split into two competing views: (1) being loved for the qualities and attributes that the other person presents (love for you) and (2) love derived from the mingling of two separate identities that form a new entity (love for us).

Although this paper is intended to be an exploratory endeavor, the final argument will lean towards the love-for-us stance. This, it will be argued, is due to the greater inherent strength of a coalesced identity. We define the self dramaturgically through the interactions with others, especially romantic partners. The interaction between romantic partners forms a strong loving bond that manifests an "us" identity and goes towards explaining the nature of love.

Exploring the Unknown Information about Preparing for Death and Dying

Sonia Swann, Social Work
Faculty Mentor: Professor Amy Manning, Social Work
Currently, data is showing the rates of death are growing every year due to growing cancer and disease rates, the large baby boomer generation coming to age, and the effects of the COVID-19 pandemic. People are becoming more aware earlier that their end of life is approaching. Due to financial reasons or personal people are less prepared for their passing. With little to no information available in print or online to "blueprint" their journey, the task of planning increases frustration and limits an effectively peaceful passage into death for the individual and those in their circle. Using preliminary information gained from open forums that included mainstream, Trans, as well as people and families with Intellectually Disabilities an initial overview of what people would like support with figuring out related to end of life planning and care has been established. This emerging process has suggested and identified some missing information gaps including how to address finances, expectations, and final plans. By using this information, we can go forward and expand our understanding of what is known and available for support while developing the next steps toward an information network to support any and all individuals' preparations and plans for the end of their journey, making for a peaceful and easier transition.

Heal Thyself? Healthcare Lobbying and the US Senate

Melissa Levandoski, Political Science
Faculty Mentor: Professor Patrick McGovern, Political Science and Public Administration
Expensive healthcare costs and poorly performing healthcare programs are burdening the American people. The purpose of the research presented here is to examine the relationship between the healthcare industry and U.S. Senators. This research explores the possibility of lobbying by healthcare companies and their PACs as the primary reason why different healthcare bills pass the Senate. Peer-reviewed literature suggest a variety of reasons as to why U.S. Senators vote as they do, including factors such as constituency service, partisanship, ideology, personal beliefs, strategic reasoning, and interest group pressure. To study this relationship, models will be developed from data collected from government websites covering campaign donations and Senate legislation. Binary logit and OLS linear regression models will be used to determine statistical significance and correlations of health care industry spending on Senate campaigns over the past few years and individual Senator support for bills that favor the industry over the public. This paper expects that lobbying by the healthcare industry outweighs the other factors outlined by the literature and that the greater the contributions the more likely a senator is to vote favorability in the interests of healthcare companies and their PACs.

Religious Freedom and LGBTQI+ Rights: A Pattern of Human Rights Adherence

Cassandra Brown, Political Science
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The protection of LGBTQI+ rights worldwide is incredibly varied, with some states offering LGBTQI+ individuals full and equal protection under the law, and some criminalizing it to the point of death. Little previous research exists to explain this variety in response; research related to LGBTQI+ rights tend to center on individual states or regions or focuses on how LGBTQI+ rights protections improve facets such as economic growth or gender equality. Some research suggests that the presence or lack thereof of accountability mechanisms, LGBTQI+-focused NGOs, and strong political and civil rights in a state directly contributes to whether LGBTQI+ rights will be protected. Using data related to GDP, regime type, rule of law, education, and social hostilities, I seek to establish that, despite not being acknowledged internationally as a human right, LGBT rights tend to follow the same patterns of adherence as other human rights, such as religious freedom. Using an ordered logit model, this research examines the human rights patterns of 154 states in the year 2010 and found that there is a strong, significant relationship between religious freedom and LGBTQI+ rights. What this implies is that LGBTQI+ rights do not operate on the level of “special rights'' as has been commonly suggested. The findings presented here indicate that the adoption of LGBTQI+ rights policy follows the same patterns and yields similar benefits as the adherence to other human rights policies.

Implementing Sensory Elements into Public Settings for Children with Autism

Mackenzie Muldowney, Interior Design
Faculty Mentor: Professor Eric Dolph, Arts and Design
This research project discusses the need for implementing sensory elements into public settings for children with autism. According to the National Autism Association, autism is a bio-neurological developmental disability that generally appears before the age of three. It impacts the normal development of the brain in the areas of social interaction, communication skills, and cognitive functions. When a child has autism their natural five senses become heightened, which can cause them to react negatively to certain interior elements like lighting, sound, color, and texture. Some characteristics of an “autism friendly” design include acoustic rated materials, avoiding harsh fluorescent lighting, a muted color palette, and being mindful of textures used. Parents who have a child with autism have difficulty bringing them into certain public settings because the design is not “autism friendly”, which can cause the child to have high anxiety and meltdowns . The solution to this problem is implementing sensory hubs into public settings across the United States. This allows the child to be able to rely on this space to feel safe and calm, whether they are feeling hypersensitive or hyposensitive to the surrounding environment.

A Cloud-Based Communication Framework for Rover Control System

Ryan Duell, CIS, **Eric Barton**, CIS and **Yongjun Lee**, CIS
Faculty Mentor: Professor Gang Hu, CIS
As part of a collaborative project in the fields of electronic engineering and computer information systems, our goal is to develop a cloud-based communication framework for a rover control system. In the previous system, the user interface component ran on the rover's hardware, placing the burden of computation for user interaction on the rover itself, which limited rover performance and consumed significant battery power. To address this issue, we propose an IoT (Internet of Things) solution in this project. Specifically, we set up a dedicated remote server for user interaction

and rover monitoring, thereby migrating the computation-intensive graphical interface component from the rover to the server. The rover, as the client side, only needs to focus on receiving commands from the server, sending required information, and manipulating the motors. From a technical standpoint, we utilize the OSC (Open Sound Control) library to develop a client-server application for exchanging communication messages and controlling the rover. We define and implement a communication protocol in Python to enable the rover to understand the messages. The project integrates the framework with the existing user interface (UI) system, embedding a camera module into the UI system and displaying processed video in real-time. Our next step is to use the system for remote voice-based rover control, where audio information will be transferred via this communication framework. It will facilitate the delivery of recognized voice commands to the rover and allow receiving sound from the remote rover. This rover communication framework plays a vital role in exploring distant environments.