Fall 2025 Faculty UTRA Opportunities Sorted by Department or Program

Please see below for full position descriptions hyperlinked in the position title.
SPRINT UTRA applications are due by May 13th, 2025 at 12:00 PM EDT (noon).

Department/Program Name	***Faculty Name***	***Project Title***
Africana Studies	Matthew Guterl	Photographic History of the Brown-Tougaloo Partnership
Africana Studies	Patsy Lewis	In the Wake: Documenting Impact of Federal Government Policies on Rhode Island's Marginalized Communities
Africana Studies	Kim Gallon	Rewriting the Record: Unpacking Synthetic Health Data Through Community Narrative
Africana Studies/Rites and Reason Theatre	Brian Meeks	A Curated Exhibition of the Brown Africana/Rites and Reason Theatre faculty, Past and Present
Alpert Medical School, Department of Medicine, Division of Hematology-Oncology	Patrycja Dubielecka-Szczerba	The role of MKK4 in JAK2 V617F -dependent pathologies
American Studies Department	Kevin Escudero	Immigrant Graduate and Professional Students' Educational and Career Trajectories
Annenberg Institute at Brown University	John Diamond	Comprehensive Assessment of Leadership Learning/Equity-Centered Leadership Preservice Program Preparation Analysis
Anthropology	Jessaca Leinaweaver	Researching the History of Brown's Anthropology Department,
Applied Mathematics and Earth, Environmental, and Planetary Sciences	Mara Freilich	Steady States in the Turbulent Ocean: Equilibrium Analysis in Biophysical Dynamical Systems
Applied Mathematics and Earth,	Mara Freilich	Modeling salinity tolerance in

Environmental, and Planetary Sciences		marine microorganisms subject to extreme storms
Behavioral and Social Sciences and Epidemiology, School of Public Health	Diana Grigsby-Toussaint	The influence of the exposure to green space on the mental health and sleep of elementary school children
Behavioral and Social Sciences, School of Public Health	Alexander Sokolovsky	Daily remote ecological assessment of marijuana and sleep (DREAMS) study
Behavioral and Social Sciences, School of Public Health	Alison Tovar	What's on Your Plate Study: Evaluating a SNAP Incentive Policy
Behavioral and Social Sciences, School of Public Health	Cara Murphy	Clinical Research Evaluating Smoking Cessation with E-Cigarettes, and Nicotine Therapy (CRESCENT) Study
Behavioral and Social Sciences, School of Public Health	David Zelaya	Addressing Alcohol Use Health Disparities in Latinx Sexual Minorities: A Culturally Congruent Motivational Intervention Targeting Intersectional Forms of Discrimination
Behavioral and Social Sciences, School of Public Health	Lauren Bohlen	Comparing Physical Activity Interventions for Behaviour Change and Wellbeing Among University Students: Transpacific Insights from Australia and the USA
Behavioral and Social Sciences, School of Public Health	Lauren Micalizzi	Maternal Substance Use during Pregnancy and Maternal-Child Health
Behavioral and Social Sciences, School of Public Health	Matthew Meisel	ASCEND: A Study of Career Entry and Network Development
Behavioral and Social Sciences, School of Public Health	Rachel Gunn	Multimethod examination of alcohol and cannabis use and patterns in a treatment sample
Behavioral and Social Sciences, School of Public Health	Shufang Sun	Promoting the mental health of disadvantaged Ukrainian

		individuals affected by war and conflict
Behavioral and Social Sciences, School of Public Health	Shufang Sun	Mindfulness-based Queer Resilience: A Clinical Trial
Behavioral and Social Sciences, School of Public Health	Tanya Benitez	Promoting Physical Activity and Healthy Eating in Latinas via Interactive Web-Based Technology
Behavioral and Social Sciences; Carney Institute for Brain Science; School of Public Health; Watson Institute	Tara White	Dignity Neuroscience in Society V
Biology Undergraduate Education	Chuck Toth	Growing Human Brain Organoids for CURE Course in Spring 2026
Biostatistics	Roee Gutman	Record Linkage with Differing Errors Across Blocks
Biostatistics	Roee Gutman	Open Source Software for Linking Individuals in the Absence of Unique Identifiers
Biostatistics, Center for Computational Molecular Biology	Ying Ma	Deep Learning for Temporal Alignment in Spatial Transcriptomics
Brown Center for Biomedical Informatics	Neil Sarkar	Structuring Ancient Ayurvedic Food Therapies for Contemporary Health Applications
Brown University Rockefeller Library	Zhuqing Li	John Hay's China Policy
Carney Institute for Brain Science; Cognitive and Psychological Sciences	Frederike Petzschner	Embodied Rewards: Interoception, Emotion, and Learning from the Inside Out
Center for Alcohol and Addiction Studies	Elizabeth Aston	Project MATEY: MArijuana and Tobacco in Emerging Young adults
Center for Alcohol and Addiction Studies	Elizabeth Aston	BEST: The Behavioral Economic Study of MicroTransitions

Center for Alcohol and Addiction Studies, School of Public Health	Jane Metrik	Cannabis' Impact on Alcohol Consumption (Project MARS)
Center for Alcohol and Addiction Studies, School of Public Health	Jane Metrik	Cannabis Health Messaging: How Does it Influence Cannabis Use?
Center for Language Studies	Michelle Quay	Kirkor Minassian & Collecting Persian Manuscripts in America c. 1900 - 1937
Center for Philosophy, Politics, and Economics	Tarana Chauhan	Female labor force participation in Asia
Chemistry	Amit Basu	What's in a name? Well, a lot, it turns out - some chemistry, biology, history, and linguistics, to be more precise.
Chemistry	Emily Sprague-Klein	Plasmon-Driven Photochemistry
Chemistry, Physics, Data Science Institute	Brenda Rubenstein	Modeling Biology on a Quantum Computer
Chemistry, Physics, Data Science Institute	Brenda Rubenstein	Launching the HumanRNAome Project at Brown
Cognitive and Psychological Sciences	Daphna Buchsbaum	How do children think and learn about the physical and social world around them?
Cognitive and Psychological Sciences	Daphna Buchsbaum	How do dogs think and learn about the physical and social world around them?
Cognitive and Psychological Sciences	David Levari	Measuring trust, listening, and learning with human and machine advisors
Cognitive and Psychological Sciences	David Levari	Programming and web development (make games for behavioral science!)
Cognitive and Psychological Sciences	Joo-Hyun Song	Perceptual enhancement related to action preparation
Cognitive and Psychological Sciences	Joo-Hyun Song	How does visual noise modulate motor learning?
Cognitive and Psychological	Julia Marshall	How do children think and learn

Sciences		about morality?
Cognitive and Psychological Sciences	Malik Boykin	Investigating the Impact of Role Model Identities on Student STEM Engagement
Cognitive and Psychological Sciences	Oriel FeldmanHall	How do people learn, represent, and navigate complex social networks?
Cognitive and Psychological Sciences	Roman Feiman	How do children learn to speak and think?
Cognitive and Psychological Sciences	Ruth Colwill	Assessing behavioral disturbances in development
Cognitive and Psychological Sciences	Ruth Colwill	Correlates of Emotional Intelligence in Companion Animals
Comparative Literature and Hispanic Studies	Alani Hicks-Bartlett	The Language Debate : Texts and Sources
Computer Science	Akshay Narayan	Analyzing Internet CCA Contention
Computer Science	Amy Greenwald	AI Applications of Bilevel Optimization with Deep Learning
Computer Science	Chen Sun	Protecting Our Planet with Multimodal Learning
Computer Science	Deepti Raghavan	Building Efficient Compound AI Applications
Computer Science	Diana Freed	AI and Youth Digital Safety
Computer Science	Diana Freed	Reproductive Health Access and Surveillance
Computer Science	Malte Schwarzkopf	Weenix Rebooted: A New Operating Systems Course for Brown
Computer Science	Nora Ayanian	Collaborative Perception for multi-robot systems
Computer Science	Ugur Cetintemel	Augmenting the "Impact Afghanistan" Web Database with AI

Computer Science	Ugur Cetintemel	AI-Augmented Database Systems
Data Science Institute	Linda Clark	Data Engineering in Disguise Course Development
Data Science Institute	Thomas Sgouros	Charter schools and public schools. Where is the money?
Data Science Institute	Ahsan Ashraf	Arbitrariness and Bias in content moderation using large language models (LLMs) on social media platforms
Dermatology	Eunyoung Cho	Epigenetics and psoriasis
Dermatology	Eunyoung Cho	Pilot trial of supplemental Vitamin A and nicotinamide in solid organ transplant recipients
Diagnostic Imaging	Zhicheng Jiao	RadiologyGPT: A Platform for Evaluating and Visualizing Medical Imaging Large Language Models
Earth, Environmental and Planetary Sciences	Baylor Fox-Kemper	Coastal Ocean Resilience through Observation-informed Modeling
Earth, Environmental and Planetary Sciences	Christopher Horvat	Characterizing Ocean Marine Heatwaves in 3D
Earth, Environmental and Planetary Sciences	Daniel Ibarra	Cave Secrets and Desert Clues: Tracing Paleoclimate with U-Series Dating of Carbonate Archives
Earth, Environmental and Planetary Sciences	Daniel Ibarra	Stable Isotope Analyses of Meteorites
Earth, Environmental and Planetary Sciences	Eben Hodgin	Provenance of Cretaceous-Neogene sandstone units on Block Island
Earth, Environmental and Planetary Sciences	Eben Hodgin	Critical Minerals of Rhode Island
Earth, Environmental and Planetary Sciences	Emily Cooperdock	Understanding faults and fluids in the North Atlantic: Data analysis and modeling approach

Earth, Environmental and Planetary Sciences	Emily Cooperdock	Communicating Earth Science Concepts through Children's Books
Earth, Environmental and Planetary Sciences	James Head	The NASA Artemis Program Human Exploration of the Moon and Mars: Designing a 500-day Mars-Like Lunar Mission
Earth, Environmental and Planetary Sciences	James Head	The NASA CLPS Mission to the Enigmatic Ina Structure on the Moon: The DIMPLE Experiment:
Earth, Environmental and Planetary Sciences	Seda Salap-Ayca	Visualizing Spatial Uncertainty: Open-Source Tools and User-Centered Evaluation
Earth, Environmental and Planetary Sciences	Tim Herbert	The world before the ice ages
Earth, Environmental and Planetary Sciences	Yongsong Huang	Novel applications of alkenones in sea ice reconstruction and hot house climate studies
Earth, Environmental and Planetary Sciences	Yongsong Huang	A novel approach to comprehensively characterize organic compounds in astromaterials for astrobiological research
Earth, Environmental and Planetary Sciences; Institute at Brown for Environment and Society	Laurence Smith	Machine-learning model development to aid satellite detection of river ice
East Asian Studies	Heeyeong Jung	Developing a performance-based, digital textbook for Korean language learners.
East Asian Studies	Heeyeong Jung	Speech style shifts occurring during cooking club activities among non-native and native speakers of Korean
East Asian Studies	Trang Tran	Vietnamese Quest II: Expanding the Gamified Journey (Beginner–Intermediate Bridge)

East Asian Studies	Hye-Sook Wang	The Koreans
Ecology, Evolution and Organismal Biology	Thomas Roberts	Eye muscle scaling and comparative morphology in vertebrates
Ecology, Evolution, and Organismal Biology	Eleanor Caves	Cleaning Behavior in Cleaner-Client Mutualisms
Ecology, Evolution, and Organismal Biology	Eleanor Caves	Exploring mechanisms underlying mutualistic cooperation
Ecology, Evolution, and Organismal Biology	Elizabeth Brainerd	High-Speed Video Analysis of Heron Predatory Behavior
Ecology, Evolution, and Organismal Biology	Patrick Green	Using automated tracking approaches to study fighting behavior in mantis shrimp.
Economics	Ivan Kwok	Active Learning in Industrial Organization
Economics	David Weil	Population Catastrophe: Explosion, Implosion, and Replacement
Education	Emily Qazilbash	Data and Evidence in Education: course development assistant
Education	Emily Qazilbash	Labor-management collaboration in K-12 public education systems: literature review and study design
Education	Indira Gil	Examining secondary math preservice teachers' selecting and sequencing strategies
Education	Matthew Kraft	How can schools become more resilient to climate change and contribute to solutions?
Education	Yoko Yamamoto	Early Gendered Views on Learning: Narratives of First-Grade Children in Japan
Education	Yoko Yamamoto	Cultural Perspectives of Teachers: Analyses of Parent-Child Conversations in

		Chinese Immigrant and Nonimmigrant Families
English	Austin Jackson	Fugitive Letters: The Prison Notebooks
English - Nonfiction Writing Program	Nell Lake	RA for the Nonfiction Writing Program's Careers Project (Journalism)
English, Nonfiction Writing Program	Emily Hipchen	RA for the Nonfiction Writing Program's Careers Project (Creative Nonfiction + Academic Writing)
Family Medicine	Rebecca Howe	Characteristics and healthcare utilization of palliative care and home-based primary care cohorts
General Internal Medicine	Joseph "Greg" Rosen	Eddembe ("Freedom"): Strategies to Support Post-Incarceration HIV Care Linkage, Re-Engagement, and Continuity among Re-Entrants in Uganda
Health Services, Policy and Practice	Elyse Couch	Experiences of novel diagnostic technologies and therapies for Alzheimer's disease
Health Services, Policy, and Practice	Emily Gadbois	Understanding Institutional Special Needs Plans
Health Services, Policy, and Practice	Emmanuelle Belanger	Understanding Symptom Patterns Across Disease Groups in Palliative Care Consultations
Health Services, Policy, and Practice	Emmanuelle Belanger	Organizational Characteristics and Care Process Associated with Quality of End-of-Life Care in Assisted Living Communities
Hispanic Studies	Iris Montero	Searching for the First Indigenous Naturalists
History	Brian Lander	Climate and Society in Ancient China

History	Holly Case	Trajectories of Historical Method, Chronology, and Conceptions of Historical Time Across the 20-21C
History	Jennifer Lambe	Popular Culture in the Americas
History	Jeremy Mumford	Exploring the Role of AI in Teaching Research and Writing
Institute at Brown for Environment and Society	Alexie Rudman	Communicating interdisciplinary coastal climate to support informed decision-making: Community-driven Coastal Climate Research and Solutions (3CRS)
International and Public Affairs	Nick Ziegler	Technology-Oriented Industrial Policies in Europe
International and Public Affairs	Nick Ziegler	U.S.-China Competition in the Semiconductor Sector
Italian Studies	Cristina Abbona Sneider	Intermediate Italian textbook
John Carter Brown Library	Karin Wulf	Brown at the Bicentennial
Linguistics	Felix Kpogo	Crossing Linguistic Borders: Immigrant Speech and New England Dialects
Linguistics	Jaime Benheim	Voice quality in interaction
Linguistics	Scott AnderBois	Making a dictionary of A'ingae, an indigenous language of Amazonia
Medicine and Biostatistics	Jeremy Warner	Collaboration Networks of Cancer Clinical Trialists
Medicine and Molecular Biology, Cell Biology, & Biochemistry	Hongwei Yao	Metabolic dysregulation in right ventricle of pulmonary hypertension
Modern Culture and Media	Lynne Joyrich	Television Studies Course Development
Molecular Biology, Cell Biology and Biochemistry	Phyllis Dennery	Exploring therapies to prevent BPD via the SASP

Molecular Biology, Cell Biology, and Biochemistry	Alvin Huang	Exploring CHI3L1/YKL-40 as a master switch of neuroinflammation in Alzheimer's Disease
Molecular Biology, Cell Biology, and Biochemistry	Mandar Naik	Identification of relative domain orientations in a modular protein using NMR residual dipolar couplings.
Molecular Biology, Cell Biology, and Biochemistry	Mandar Naik	Characterization of peptide binding orientations using NMR paramagnetic relaxation enhancements.
Molecular Biology, Cell Biology, and Biochemistry	Mark Johnson	The pollen tube: adaptation to climate change at the cellular and molecular level
Molecular Biology, Cellular Biology, and Biochemistry/Biology Education	William Holmes	Catalyzing Collaboration: Peer-Led Innovation in Biochemistry Education
Music	Enongo Lumumba-Kasongo	Black Music Lab
Music	Enongo Lumumba-Kasongo	NuBlack Music Group: Independent Record Label Development
Music	Genevieve Allotey-Pappoe	Black Music Nomad
Music	Genevieve Allotey-Pappoe	The Music Industry
Native American and Indigenous Studies Initiative	Mack Scott	Tall Oak Weeden Archive
Neurology	Liqi Shu	Clinical Neurotechnology: Building Movement Databases and Assessing Diagnostics for Neurological Disorders
Neurology	Liqi Shu	Neurotechnology: Enhancing Medical Care through Machine Learning and Computer Vision
Neurology	Saud Alhusaini	The correlation between genetic risk factors and subclinical phenotypes in common movement disorders

Neuroscience	David Sheinberg	Simulating motion with our eyes
Neuroscience	Elena Oancea	Light detection and signaling in human skin melanocytes
Neuroscience	James Simmons	Sonar guidance of swarming in echolocating bats
Neurosurgery & Neuroscience	Wael Asaad	Research in Neurophysiology & Neuromodulation
Neurosurgery & Neuroscience	Wael Asaad	Artificial Intelligence to Advance the Clinical Neurosciences
Orthopedics	Qian Chen	Developing Nanopieces antisense oligonucleotides therapeutics crossing the blood-brain barrier
Pandemic Center, Epidemiology, School of Public Health	Jennifer Nuzzo	Africa Health Security Index
Pandemic Center, School of Public Health	Georgia Lagoudas	Breathe Easy: How the Public Health Community Can Play a Role in Healthy Buildings
Pandemic Center, School of Public Health	Georgia Lagoudas	A Breath of Fresh Air: International Policy Roadmap for Clean Indoor Air
Pathology and Laboratory Medicine	Daniel Spade	Phthalate effects on Sertoli cell and rete tubular cell morphology
Pathology and Laboratory Medicine	Ece Uzun	Predicting Recurrence of Uterine Corpus Endometrial Carcinoma Using Machine Learning Based Models
Pathology and Laboratory Medicine	Jeff Morgan	Determining the effects of growth factors on an in vitro model of fibrosis
Pathology and Laboratory Medicine	Martin Taylor	Towards Selective Inhibition of LINE-1 in Mice, Dogs, and Humans for Cancer Prevention
Pediatrics	Maayan Leroy-Melamed	Sexual and Reproductive Health in Sickle Cell Disease
Pediatrics and Psychiatry and	Alexandrea Craft	Juggling roles

Human Behavior		
Pediatrics; Psychiatry	Sheryl Kopel	Pediatric Health Disparities Research Program
Physics	Greg Landsberg	Rediscovering Higgs Boson with the CMS Open Data
Physics	Ian Dell'Antonio	Galaxy Cluster Stellar Masses in the Near Infrared
Physics	Jennifer Roloff	Characterization of silicon detectors for high energy physics applications
Physics	Leenoy Meshulam	The Physics of Octopus Skin Patterns
Physics	Loukas Gouskos	AI and ML in FPGA and ASIC
Physics	Loukas Gouskos	Development of the Next Generation of Silicon Detectors for Future Particle Colliders
Physics	Matt LeBlanc	Building the Tools for Discovery: Open Source Software Developments for Particle Physics
Physics	Matt LeBlanc	Improving Quantum Physics Instructional Labs
Physics	Richard Gaitskell	Development of AI Physics Game using Reinforcement Machine Learning and Physics-Informed Neural Nets
Physics	Richard Gaitskell	Development of a web client interface and server for an AI Space Physics Game
Political Science	Peter Andreas	History of the Illicit Global Economy
Program in Judaic Studies	Katharina Galor	Children's Drawings from Israel-Palestine
Psychiatry and Human Behavior	Anna Yeo	Dietary Patterns and Asthma in Children (Project DPAC)

Psychiatry and Human Behavior	Elizabeth (Betsy) Tampke	Cross-Cutting Trauma-informed Peer Aggression and Dating Violence Prevention for Preteens Receiving Intensive Mental Health Services
Psychiatry and Human Behavior	Grace Cushman	Developing Prevention and Intervention Strategies to Improve Adolescent Health
Psychiatry and Human Behavior	Laura Korthauer	Digital cognitive assessment in patients with chronic kidney disease on dialysis
Psychiatry and Human Behavior	Sarah Thomas	Investigating Adolescent Cannabis Use With Neurobehavioral Methods
Psychiatry and Human Behavior, Brown Medical School	Barbara Jandasek	Hasbro Children's Partial Hospital Program
Psychiatry and Human Behavior; Pediatrics	Michelle Pievsky	Creating a More Efficient Pathway from Primary to Specialty Care for Children with Developmental Concerns
RNA Center, Molecular Biology, Cell Biology, and Biochemistry	Shobha Vasudevan	Targeting post-transcriptional mechanisms of tumor persistence
School of Engineering	Daniel Harris	Course-Based Undergraduate Research Experience in Design Engineering
School of Engineering	Ian Wong	Profiling Circulating Tumor Cell Heterogeneity using Computer Vision and Machine Learning
School of Engineering	Jimmy Xu	Exploratory Research for Compute-in-Memory
School of Engineering	Kimani Toussaint	Exploring Two-Photon Polymerization with AI
School of Engineering	Kimani Toussaint	Health Technology Sandbox
School of Engineering	Kurt Pennell	PFAS Fate and Transport in Unsaturated Soils
School of Engineering	Kurt Pennell	Foam Fractionation to Remove

		PFAS from Water
School of Engineering	Lucas Caretta	Embedded Insight: Real-Time Lab Infrastructure Monitoring with Raspberry Pi
School of Engineering	Mauro Rodriguez	Numerical simulations of acoustic wave-soft tissue interface interaction
School of Engineering	Xuning Zhao	Using Data Assimilation to Study Bubble Dynamics Near Metal Surfaces
School of Engineering, Computer Science	Nora Ayanian	Quadrotor dynamic flow sensing under aerodynamic disturbances
School of Medicine	Robin Miller	NNNS-II (NeoNatal Neurobehavioral Scale) Training Curriculum Development
School of Public Health	Patricia Risica	Trauma and Eating Behaviors Systematic Review
School of Public Health	Patricia Risica	Healthy Start - Pilot project to improve dietary intake in childcare and at home.
Science, Technology and Society	Xan Chacko	Botanizing Worlds
Sheridan Center for Teaching and Learning/English	Jenna Morton-Aiken	Writing the History of Brown's Writing Fellows Program (1982–2023)
Sociology	Carrie Spearin	Curricular Redevelopment: The Senior Seminar
Sociology	Carrie Spearin	Program Evaluation: Promoting a diverse & competitive research workforce
Sociology	John Logan	Mapping segregation and neighborhood inequality
Sociology	Nicole Gonzalez Van Cleve	Race and Wrongful Conviction in the U.S.
Sociology/Watson School for International and Public Affairs	Han Zhang	Bridging the Technical Gap: Empowering Social Scientists in

		the AI Age
Sociology/Watson School for International and Public Affairs	Han Zhang	Using Generative AI to Create Visual and Audio Stimuli for Survey Experiment Research in Social Sciences
Sociology/Watson School for International and Public Affairs	John Eason	Punishment Beyond Mass Incarceration: Immigrant Detention, Jails, and Prison
Surgery	Lindsay Clark Donat	HPV Occupational Exposure: Vaccination Awareness and Acceptance Among Healthcare Trainees
The Center for Advancing Health Policy through Research, Health Services, Policy & Practice, School of Public Health	Andrew Ryan	Improving Value in U.S. Health Care Spending
Visual Art	Becci Davis	Unpolished Legacies Online
Watson Institute for International and Public Affairs	David Polatty	Human Security Simulation Development
Watson Institute for International and Public Affairs	Tyler Jost	Major Power Cooperation in the Modern Era
Watson Institute for International and Public Affairs, Anthropology Department	Ieva Jusionyte	Extraditions: Can Justice Be Exported?

Faculty Opportunities

Matthew Guterl
Department: Africana Studies
Project Type: Research
Project Title: Photographic History of the Brown-Tougaloo Partnership

Project Description:
Brown has a 50+ year history of successful exchanges with Tougaloo College. The goal is to contact BTP alums and to work with them to create a comprehensive archive of the exchange, which will be housed at the John Hay Library. First steps will include a newspaper archive and a photographic archive, and future steps will include correspondence in personal and university archives.

Required qualifications: Organization skills include careful filing and storage of images and pdfs. Other skills include the ability to write grammatically correct emails and a knack for recognizing an object of historical significance..

Preferred qualifications: Open to anyone interested in this history.

Is this project for more than one student: Yes

Patsy Lewis
Department: Africana Studies
Project Type: Research
Project Title: In the Wake: Documenting Impact of Federal Government Policies on Rhode Island's Marginalized Communities

Project Description:
The project proposes to establish the effects of Federal government initiatives beginning in 2025 over a range of areas on communities of color in Rhode Island, and document community responses. These include immigration, health, education, and social security, inter alia. The project records and amplifies the effects of these changes on low-income and communities of color, providing a cohesive platform for the public to access this information. We aim to create a record of Federal and State government initiatives that affect vulnerable communities, especially communities of color in Rhode Island. Because of the wide scope of the Federal government's actions and their likely exponential effects, we will narrow the focus of our investigation to the measures with the most egregious effects on low-income and communities of color. This project builds on the work of the project In the Wake of George Floyd which centered on documenting protests against police violence across Rhode Island and identifying the interactions between communities of color and the state.

The student will make an original contribution to the research by tracking and collecting data on federal government policies and legislation; impacts on Rhode Island communities of color; and responses, including protests, lawsuits, and other actions. The student will expand our archive of interviews with community leaders by interviewing 1-2 people active in local organizations for social justice. The student's contribution represents a new element to the project we have not been able to do so far given the limited resources we have been working with. The student will be supervised by Patsy Lewis, Research Professor, Department of Africana Studies and Tarika Sankar, Digital Humanities Librarian, Center for Digital Scholarship.

Required qualifications: We do not require the student to have any specialized skill but expect a basic familiarity with humanities research methods and issues of racial justice.

Preferred qualifications: N/A

Is this project for more than one student: No

Kim Gallon
Department: Africana Studies
Project Type: Research
Project Title: Rewriting the Record: Unpacking Synthetic Health Data Through Community Narrative

Project Description:
Rewriting the Record: Unpacking Synthetic Health Data Through Community Narrative

Rewriting the Record: Unpacking Synthetic Health Data Through Community Narrative is a research participatory project that explores how synthetic health data, artificially generated data modeled on real patient records, shapes our understanding of health, identity, and care. While synthetic data is often used to protect privacy and drive innovation, it can also reproduce the same racial and structural biases found in real-world health systems. This project invites communities to reflect on how they are represented—or misrepresented—in these data systems and to use storytelling, dialogue, and creative practice to challenge, rewrite, and reimagine those narratives. By centering lived experience and community knowledge, Rewriting the Record opens up new ways of thinking about data justice, digital ethics, and the future of health equity.

https://sites.brown.edu/chid-lab/chid-lab-projects/

Required qualifications: 1. Coursework in one or more of the following areas: Public Health, Health Sciences, or Epidemiology, Africana Studies, American Studies, or Sociology (with a focus on health disparities or social determinants of health) 2. Research and Writing Skills: Strong academic writing and communication skills Experience conducting literature reviews (Ability to synthesize information from diverse sources, including peer-reviewed articles, policy reports, and archival materials. Ability and experience working within a team

Preferred qualifications: 1. Public Health and Social Justice Knowledge: Understanding of health disparities, especially within racialized and underserved communities Familiarity with concepts such as structural racism, community health, and social determinants of health Awareness of historical and contemporary public health issues in the U.S.
2. Technical and Analytical Skills: Interest in or experience with artificial intelligence (AI), data ethics, or digital tools in health research

Is this project for more than one student: Yes

Brian Meeks
Department: Africana Studies/Rites and Reason Theatre
Project Type: Research
Project Title: A Curated Exhibition of the Brown Africana/Rites and Reason Theatre faculty, Past and Present

Project Description:
The faculty of the Brown Africana Studies/Rites and Reason Theatre Department has a proud record of scholarship, teaching and community involvement going back to its origins in the student movement and

protests of the late nineteen sixties. Members of the Department, both past and present have been leading scholars, writers and directors in their respective fields of Black Theatre, African writing, Africana philosophy, Caribbean Studies , Afro-Brazilian studies and Black popular culture. Among those who have passed, mentioning their names alone suggests the significance of their national and international influence, including Chinua Achebe, George Houston Bass, Ama Ata Aidoo, George Lamming and Anani Dzidzienyo. The aim of this project would be to highlight the work and contribution of members of the faculty, past and present, through the creation of both a physical exhibition featuring their respective contributions and a digital database that would be linked to the Department's website. The purpose of this effort is obvious from the perspective of recovering historical memory, as the generation that established the Department passes on. It is also even more significant in a time when the Government and influential circles are questioning the significance and importance of departments and programs that express and explore the Black and African diasporic role in the world. The exhibition and database would clearly recognize the remarkable contribution that Brown Africana/Rites and reason theatre faculty have made to Africana Studies both globally and at Brown university.

Required qualifications: basic library and digital research skills. More advanced experience at designing and implementing exhibitions would be appreciated, but not required.

Preferred qualifications: Students who have done courses in Africana Studies would be given special consideration.

Is this project for more than one student: No

Patrycja Dubielecka-Szczerba
Department: Alpert Medical School, Department of Medicine, Division of Hematology-Oncology
Project Type: Research
Project Title: The role of MKK4 in JAK2 V617F -dependent pathologies

Project Description:
JAK/STAT signaling pathway is significantly upregulated in blood cancers of myeloid origin. Mutations in Janus kinase 2, specifically JAK2 V617F, resulting in constitutive activation of JAK/STAT cascade are dominant in myeloproliferatyive neoplasms (MPNs) We recently applied proximity proteomics to define the interactomes of wild-type and V617F-mutated JAK2. Our data revealed that the JAK2 V617F-specific interactome includes stress-activated kinase MKK4 (MAP2K4), which functions as a dual-specificity kinase regulating both JNK and p38 MAPK signaling. Preliminary data from our lab suggest that MKK4 may serve as a key integrator of JAK/STAT and MAPK signaling in MPNs. To define the role of MKK4 in the development of MPNs. We will evaluate MKK4 signalome activation status and assess the impact of its inhibition or loss on key signaling pathways, including JAK/STAT and MAPK, using both cellular models of MPN. Epistatic analyses and reverse genetic approaches will be employed to dissect the specific contributions of individual MKK4 signalome components to MPN-associated cellular phenotypes.

Required qualifications: NA

Preferred qualifications: NA

Is this project for more than one student: No

Kevin Escudero
Department: American Studies Department
Project Type: Research
Project Title: Immigrant Graduate and Professional Students' Educational and Career Trajectories

Project Description:
This research project focuses on examining the workforce experiences of immigrant student graduate/professional degree program alumni in the U.S. workforce. To better understand the experiences of this community, members of the project research team will conduct virtual Zoom interviews with alumni currently employed across a variety of fields/professions. Findings from this project will lay the foundation for the development of a series of policy recommendations which can in turn be implemented by colleges/universities (including career services offices) to increase supports for members of this student population. During the fall 2025 semester, the selected student research assistants will work alongside other project team members to conduct Zoom interviews and code and analyze the interview data.

Required qualifications: N/A

Preferred qualifications: 1) Previous coursework focusing on the experiences of immigrant communities in the United States

2) Previous or ongoing volunteer/internship experience working with immigrant communities

3) Prior training in qualitative research methods, specifically in-depth interviewing

Is this project for more than one student: Yes

John Diamond
Department: Annenberg Institute at Brown University
Project Type: Research
Project Title: Comprehensive Assessment of Leadership Learning/Equity-Centered Leadership Preservice Program Preparation Analysis

Project Description:
The broad objectives of the Comprehensive Assessment of Leadership Learning/Equity-Centered Leadership (CALL-ECL) Principal Pipeline Initiative project are to evaluate and support district efforts to prepare equity-centered school leaders. With support from the Wallace Foundation, eight school districts around the country partnered with local universities and their state education departments to pilot a six-year effort to develop equity-centered principal pipelines. A central component of the project is to document and evaluate program implementation across the various partners engaged in this work. Study B within the project focuses specifically on university partners/institutions of higher education. This effort involves interviewing university partners and collecting various forms of data (course lists, degree

requirements, syllabi, recruitment materials, etc). Students working on this project will assist in updating databases, transcribing interviews, coding interviews and artifacts, and producing memos on common themes/trends. They will join a research team consisting of the Primary Investigator, postdoctoral research associates, graduate research assistants, and undergraduate research assistants. Students will be expected to participate in weekly/bi-weekly virtual meetings to discuss progress on work.

Required qualifications: Strong communication skills and ability to work independently. Experience with some type of qualitative data management software.

Preferred qualifications: Coursework in education, sociology, and/or organizational behavior studies.

Is this project for more than one student: No

Jessaca Leinaweaver
Department: Anthropology
Project Type: Research
Project Title: Researching the History of Brown's Anthropology Department,

Project Description:
This research project will involve collecting and analyzing information about the history of Brown's Anthropology Department. A brief history is here [https://anthropology.brown.edu/who-we-are/history]. The student researcher will work with some existing collections (e.g. searching the Brown Daily Herald archive) and create others (e.g. interviews with retired faculty). The student researcher will be learning and employing simple qualitative analysis techniques (open and closed coding of text passages, for example), and writing substantial portions of a fuller history. This project can take multiple, simultaneous forms and the student researcher is welcome to propose and carry out different presentation formats (visual, audio, text, etc.) resulting in a research portfolio.

Required qualifications: Interest in qualitative social science (e.g. anthropology, history, sociology, ethnomusicology, ethnic studies)

Preferred qualifications: past coursework in anthropology

Is this project for more than one student: No

Mara Freilich
Department: Applied Mathematics and Earth, Environmental, and Planetary Sciences
Project Type: Research
Project Title: Steady States in the Turbulent Ocean: Equilibrium Analysis in Biophysical Dynamical Systems

Project Description:
Understanding how carbon dioxide sequestration will change in response to a shifting climate represents

one of the most critical uncertainties in current climate models. Phytoplankton play a fundamental role in the global carbon cycle, absorbing carbon from the atmosphere and forming the foundation of marine food webs. However, accurately modeling phytoplankton population dynamics presents significant challenges due to the coupled nature of biological processes and physical ocean dynamics, whose effects are themselves often modeled rather than explicitly resolved due to computational constraints. Mathematically, phytoplankton ecosystems have been represented using coupled nonlinear dynamical systems (sets of time-dependent differential equations), such as Nutrient-Phytoplankton-Zooplankton (NPZ) models. These models permit the identification of equilibrium states: conditions where the biological variables have a constant spatial distribution in time. Such equilibria could potentially be leveraged to develop parameterizations, or simplified representations, of these biological dynamics for use in climate models, reducing computational requirements while still representing important biophysical interactions.

This project investigates a fundamental question: How far from equilibrium do these biophysical systems operate under realistic ocean conditions? The key tasks will be (1) analyze archetypal NPZ dynamical systems to find the equilibria, (2) modify a fluid dynamics solver in Python in order to run simulations of these systems, (3) use statistical analyses to measure the deviation under different flow conditions, and (4) determine which equilibria demonstrate a greater resilience to physical forcing and which flow characteristics facilitate either the maintenance of or rapid return to equilibrium states. The student will develop skills in mathematical modeling, computational fluid dynamics, and statistical analysis, and gain knowledge in the fields of dynamical systems and oceanography. This project will involve working closely with Professor Mara Freilich and Ph.D. student Lulabel Ruiz Seitz. There will be opportunities to pursue different directions in the project based on the specific interests of the student.

Required qualifications: Math background: completion of APMA 355 and 365 or equivalent Coding background: basic familiarity with Python

Preferred qualifications: Completion of APMA 1360 or 1930P

Is this project for more than one student: No

Mara Freilich
Department: Earth, Environmental and Planetary Sciences and Applied Mathematics
Project Type: Research
Project Title: Modeling salinity tolerance in marine microorganisms subject to extreme storms

Project Description:
Extreme storms are projected to become more frequent with a changing climate. How might these storms impact the oceans and carbon cycling? Storms will impact the concentration of salt (or salinity in the ocean). Salinity impacts the metabolism of marine microorganisms, hence future changes in salinity may change the habitat and the biology of microorganisms. Research from plant literature reports that secondary metabolism (chemical compounds that are not directly essential for growth, but may influence fitness and alter the organism's chemical environment) may play an important role in salt tolerance (Benjamin et al. 2019; Sunita et al. 2020; Hossain et al. 2017). This project will combine oceanographic model data analysis with bioinformatic analysis of metatranscriptomic data (gene expression across a community of microorganisms). The key tasks will be to (1) leverage model output to identify regions of the global ocean that have seasonally or consistently atypical or high variability in salinity, or where

storms are predicted to increase with increasing average temperature, (2) to identify metatranscriptomic datasets from those regions, and (3) to investigate relative differences in secondary metabolite pathways that may contribute to the survival or success of organisms in areas with unusual salinity. Objective (3) will involve mining the literature for experiments that have measured gene expression with salt concentration and then extracting mentioned genes from the environmental data. A research student on this project would work closely with Professor Mara Freilich and Postdoctoral Fellow Arianna Krinos, and there are opportunities to tailor the project towards oceanographic data analysis or bioinformatic objectives based upon the interests of the student. This project will involve interfacing with ideas and data from the NSF Center for Chemical Currencies of a Microbial Planet (C-CoMP).

Required qualifications: N/A

Preferred qualifications: knowledge of or interest in bioinformatic data processing, Python and R programming, and high-performance computing

Is this project for more than one student: No

Diana Grigsby-Toussaint
Department: Behavioral and Social Sciences and Epidemiology, School of Public Health
Project Type: Research
Project Title: The influence of the exposure to green space on the mental health and sleep of elementary school children

Project Description:
The goal of this project is to investigate the influence of exposure to green space on the mental health, sleep, cognition, and physical activity behavior of elementary school children in Rhode Island. Students will be trained to collect anthropometric data, bone mineral density measurements, administer surveys, and collect biometric samples. In addition, students will have the opportunity to support literature reviews and data analysis efforts, as well as assist with manuscript writing.

Required qualifications: experience working with children, ability to work as part of a multidisciplinary team

Preferred qualifications: experience writing literature reviews, conducting data analysis

Is this project for more than one student: No

Alexander Sokolovsky
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Daily remote ecological assessment of marijuana and sleep (DREAMS) study

Project Description:
Background: Depression and cannabis use are major public health issues in the U.S., especially in young

adults. Depression rates have increased sharply over the past two decades, alongside rising cannabis use. Although some young adults use cannabis to relieve depression symptoms, long-term cannabis use can actually worsen depression. However, the exact reasons for this link are not well understood.

Study: This study explores how sleep and negative emotions can serve as links between cannabis use and depression. This study will use wearable biosensors and real-time self-report to track cannabis use, sleep, mood, and depression symptoms in 65 young adults aged 18–34. Data will be collected at multiple time points over nine months. The findings aim to improve understanding of how cannabis impacts mental health and guide future treatment and policy decisions.

UTRA: This opportunity is for students interested in substance use, mental health, and sleep, and who would like to gain research skills. Students will work on the DREAMS study, examining links between cannabis use and depression. Activities vary, but may include recruitment, tracking engagement, and data collection. Interested students may also be able to participate in data analyses and co-author a manuscript.

Required qualifications: Detail oriented, strong communication skills, Google Workspace, independent time management

Preferred qualifications: Experience with literature searches and Qualtrics are preferred but not required

Is this project for more than one student: No

Alison Tovar
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: What's on Your Plate Study: Evaluating a SNAP Incentive Policy

Project Description:
The What's on Your Plate Study is evaluating a Rhode Island SNAP Incentive Legislation (Eat Well Be Well). This program is automatically delivered to all SNAP households in
RI and provides a $0.50 credit directly to each participant's EBT card for every dollar spent, up to $25.00/month, on fresh fruits and vegetables at participating retailers. Students will work on this project and help collect follow-up data to evaluate the impact of this legislation on dietary outcomes. We are collecting both survey and interview data and students may have an opportunity to participate in both the collection and analysis of this data.

Required qualifications: ● Attention to detail ● Some knowledge of quantitative and qualitative data ● Organized ● Proficient with Google Docs/Sheets and Microsoft products (word and Excel)

Preferred qualifications: Spanish Speaking

Is this project for more than one student: No

Cara Murphy
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Clinical Research Evaluating Smoking Cessation with E-Cigarettes, and Nicotine Therapy (CRESCENT) Study

Project Description:
The Murphy Brown Lab (MBL) in the School of Public Health conducts rigorous research that can offer new insights to understand and address modifiable risks to health such as the use of tobacco and other addictive substances, and the intersection of addictive behaviors and weight-related behaviors that can contribute to obesity.

We have just launched a project through the Brown Center for Addiction & Disease Risk Exacerbation that will examine the effects of various nicotine products on smoking, weight, and other clinical indicators like inflammation and exhaled carbon monoxide. Conducted entirely online, this research will engage individuals with obesity who smoke cigarettes from across the U.S., utilizing Zoom for interactive sessions.

As a student contributor in the MBL, you will gain invaluable human subjects research experience with direct participant contact, including:
1. Conducting Assessments: Interview participants and guide them through key measurements (training provided).
2. Participant Liaison: Build connections with participants throughout their time in the study, meet with them for weekly check-in sessions, provide communication, support, information, resources, and reminders to participants.
3. Research Coordination: Help organize participant appointments, materials, and compensation.
4. Database management: Assist in updating and maintaining essential study databases

Students will participate in lab meetings with the study investigator and collaborate with fellow students and staff dedicated to the project. Motivated students may be invited to contribute to other MBL products and projects such as conference presentations. There may also be opportunities to contribute to other collaborative research endeavors with the MBL such research investigating the harm-reduction potential of nicotine pouches and on screening and prevention of disease associated with alcohol use and metabolic dysfunction.

For more details about our research and team, visit our website: https://sites.brown.edu/murphybrownlab/

For more details about the Center for Addiction & Disease Risk Exacerbation, visit: https://www.brown.edu/academics/public-health/cadre/home

We look forward to welcoming passionate students eager to make a difference in public health!

Required qualifications: Familiarity with Zoom, Microsoft Suite (Word, Excel), Google Suite (Gmail, Google Calendar, Google Voice, Google Drive), strong communication and interpersonal skills, ability to work independently and as part of a team, ability to develop rapport with research participants.

Preferred qualifications: Prior research experience with human subjects, at least one course in psychology or public health.

Is this project for more than one student: No

David Zelaya
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Addressing Alcohol Use Health Disparities in Latinx Sexual Minorities: A Culturally Congruent Motivational Intervention Targeting Intersectional Forms of Discrimination

Project Description:
The current study aims to develop an intervention that will address alcohol misuse within Latinx sexual minorities by targeting intersectional forms of discrimination (i.e., racism and heterosexism) as there are no behavioral health interventions that address the unique needs of Latinx sexual minorities within the context of alcohol misuse. The study will adapt a Latinx focused motivational interviewing intervention (Culturally Adapted Motivational Interviewing [CAMI]) using an LGBTQ-affirmative intervention adaptation model to develop a culturally-congruent intervention, with community partnerships, to conduct a pilot randomized controlled trial. Findings will provide initial evidence for a novel intervention to decreases alcohol-related problems and misuse for Latinx sexual minorities. We have finalized aim 1 (in-depth qualitative interviews with Latinx SM's (n= 10 NE; n= 10 SW) to understand their experiences of intersectional forms of discrimination and its impact on alcohol use and to garner initial feedback on a draft of the adapted intervention). Therefore, the work will involve qualitatively coding the interviews and completing the treatment manual.

Required qualifications: N/A

Preferred qualifications: The student should have familiarity with Microsoft suite and Google suite; be bilingual in English and Spanish; strong attention to detail; excellent communication and interpersonal skills; ability to work as part of team and self-motivated; and comfort with sensitive subjects (e.g., addiction and discrimination).

Is this project for more than one student: No

Lauren Bohlen
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Comparing Physical Activity Interventions for Behaviour Change and Wellbeing Among University Students: Transpacific Insights from Australia and the USA

Project Description:
Primary objectives:
- Conduct a review of published literature to identify differences and similarities in physical activity interventions at universities in Australia and the USA, including how these programs aim to foster sustainable behavior change among students.

- Evaluate links between physical activity interventions and improvements in student wellbeing, including mental health and academic performance. The role of cultural and educational differences between these countries in shaping program approaches and outcomes.

The student will be focal in working with the faculty researchers (Dr. Bohlen at Brown, and a collaborator in Australia) to conduct a (narrative or brief/rapid) literature review. The aim will be to establish a draft manuscript for which the student would have the opportunity for authorship pending suitable contributions. This literature review will explore the role of physical activity interventions in improving student wellbeing and fostering sustainable behavior change. The review will emphasize examining cultural and educational differences between Australia and the USA, to better understand how to develop adaptable, evidence-based interventions suitable for different global health contexts. This project will help students gain hands-on research experience, develop skills in critical analysis and academic writing, and contribute to advancing understanding of the role of physical activity in promoting student health and success. This opportunity is ideal for those interested in health research, public health, or education.

Required qualifications: Searching for published literature in academic databases

Preferred qualifications: Systematic reviews; narrative reviews

Is this project for more than one student: No

Lauren Micalizzi
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Maternal Substance Use during Pregnancy and Maternal-Child Health

Project Description:
My research focuses on maternal substance use during pregnancy and its impact on both maternal and child health outcomes. This work examines the complex factors that contribute to substance use in this population, including mental health challenges, stress, and adverse childhood experiences. By combining clinical, behavioral, and digital health approaches, my research aims to identify risk factors, promote behavior change, and improve family outcomes.

I welcome students interested in maternal health, public health, substance use, and/or child development to join our team. This internship opportunity offers hands-on experience supporting two ongoing NIH-funded projects: (1) a study investigating the long-term effects of prenatal tobacco exposure on child development, and (2) research examining maternal and infant health outcomes following prenatal cannabis use. Students will gain valuable insight into maternal and child health research while contributing to projects designed to improve family well-being.

Required qualifications: Comfort and willingness to work with families from low-income and/or diverse populations

Preferred qualifications: -- Strong verbal and written communication skills
-- Excellent interpersonal and organizational skills
-- Attention to detail; maturity, and responsibility

-- Ability to prioritize tasks, perform multiple tasks efficiently and accurately, take initiative and maintain organized working conditions
-- Openness to and interest in learning new skills

Is this project for more than one student: No

Matthew Meisel
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: ASCEND: A Study of Career Entry and Network Development

Project Description:
We are seeking students to join a research project that will examine young adults' transition into the workforce. In Project ASSCEND, we will recruit a national sample of young adults before they enter different high-risk occupations for alcohol misuse and examine how the social contextual characteristics of these occupations influences their own alcohol use. All data collection will occur either via Zoom or online surveys. The student will be supervised by Matthew Meisel, faculty in the Center for Alcohol and Addiction Studies (SPH, Behavioral and Social Sciences).

Tasks will include: 1) participant recruitment (e.g., posting advertisements, social media recruitment, responding to interested contacts); 2) conducting brief Zoom sessions with potential participants verifying eligibility; 3) conducting orientation sessions with participants; 4) helping with participant tracking; 5) promoting study retention via regular contact with participants; and 6) basic data management and analyses. Students will attend weekly lab meetings with the study investigator and the research team.

Required qualifications: Ability to use Zoom in private locations; knowledge of Microsoft Suite (Word, Excel) and Google Suite (Gmail, google calendar, google voice, google drive); strong communication and interpersonal skills, ability to work independently and as part of a team; comfort working with research participants

Preferred qualifications: Research experience (especially with human subjects) and psychology or public health coursework.

Is this project for more than one student: No

Rachel Gunn
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Multimethod examination of alcohol and cannabis use and patterns in a treatment sample

Project Description:
In the wake of the increased medicalization of cannabis use and reduced risk perception, there is an

increased use of cannabis across a wide variety of populations. Among those in treatment for alcohol use, there is also increased endorsement of cannabis as a substitute for alcohol use. However, epidemiological data suggest that cannabis use leads to poorer alcohol treatment outcomes. The purpose of this study is to examine the long-term impact of cannabis use on alcohol treatment outcomes using ecologically-valid assessments. We recruit individuals who recently entered alcohol treatment into a 12-month mixed-method (laboratory and ambulatory assessment) study. Data collection occurs in the laboratory and the natural environment, including transdermal alcohol biosensors (i.e., objective measurement of drinking behaviors). We are seeking a student to help in data collection for this project. The student will be supervised by Rachel Gunn, faculty in the Center for Alcohol and Addiction Studies (SPH, Behavioral and Social Sciences) who leads the PACE Lab. Tasks will include: 1) participant recruitment (e.g., posting advertisements, social media recruitment, responding to interested contacts), 2) screening participants and completing informed consent; 3) maintaining study databases and the study website; 4) tracking participant data in real-time; 5) promoting study retention via regular contact with participants; and 6) basic data management and analyses. Students with prior research experience may have the opportunity to conduct data collection. Students will attend weekly lab meetings with the study investigator and other undergraduate and graduate research assistants and full-time staff contributing to the project.

Required qualifications: Ability to use Zoom in private locations; knowledge of Microsoft Suite (Word, Excel) and Google Suite (Gmail, google calendar, google voice, google drive); strong communication and interpersonal skills, ability to work independently and as part of a team, comfort working with research participants and discussing substance use.

Preferred qualifications: Research experience (especially with human subjects) and psychology or public health coursework and/or data analysis experience (especially with SPSS or R/ RStudio).

Is this project for more than one student: No

Shufang Sun
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Promoting the mental health of disadvantaged Ukrainian individuals affected by war and conflict

Project Description:
Two international, collaborative projects aims to foster collaborative relationships with local investigators and organizations at Ukraine to understand and address the mental health needs of displaced Ukrainians affected by the Russian invasion, with an emphasis of developing mindfulness interventions responsive to experiences of war, violence, grief, and displacement. Two pilot projects are ongoing, including (a) developing a mindfulness-based mobile health program for displaced adolescents in Germany via formative research followed by a randomized controlled trial; and (b) understanding and addressing the needs of internally displaced adult patients on MOUD treatment in methadone clinics within Ukraine via surveys and qualitative interviews. Students will be working on various aspects of both projects, including literature review, assisting with qualitative and quantitative aspects of research, facilitating global team meetings, and writing.

Required qualifications: Prior relevant coursework in psychology, public health, sociology, or other relevant fields.

Preferred qualifications: Interest and experience in mental health research and global research are strongly preferred. Ability to speak and understand Ukrainian will be highly desirable, though not required.

Is this project for more than one student: Yes

Shufang Sun
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Mindfulness-based Queer Resilience: A Clinical Trial

Project Description:
Mindfulness-based Queer Resilience (MBQR) is an intervention program tailored for LGBQ+ young adults that has been tested in a previous randomized controlled trial. In the next phase of the study, we will develop a version of MBQR that is scalable and highly feasible, and conduct a clinical trial involving 200-300 LGBQ+ young adults with psychiatric symptoms (depression, anxiety).

Required qualifications: Relevant courework in public health, psychology, sociology, or other relevant field.

Preferred qualifications: Individuals with lived experiences as LGBQ+ are highly desired, although not required. Skills in coordination and community organization are highly desired. Interest and experience in LGBTQ+ mental health and clinical research are strongly preferred.

Is this project for more than one student: Yes

Tanya Benitez
Department: Behavioral and Social Sciences, School of Public Health
Project Type: Research
Project Title: Promoting Physical Activity and Healthy Eating in Latinas via Interactive Web-Based Technology

Project Description:
The goal of this NIH-funded research study is to help Latinas meet national physical activity and dietary guidelines. “Mi Buena Vida” is a pilot trial of a Spanish language web-based multiple behavior intervention (physical activity and healthy eating) for Latina women. The student will be involved in day-to-day activities related to implementing this research study. These activities include: 1) participant contacts via zoom and phone calls (e.g., eligibility screening, orientation sessions, scheduling visits), 2) participant recruitment and community outreach (social media recruitment, attending recruitment events, reaching out to community organizations, posting flyers); 3) assisting with lab visits and interpreting (English/Spanish), 4) other project-related tasks (e.g., downloading and reviewing data from activity

monitors, mailing study materials, reviewing qualitative data). The student will attend weekly study meetings with the investigator and research assistant.

Required qualifications: Strong organizational, communication, and interpersonal skills, attention to detail, ability to work independently as well as with others.

Preferred qualifications: Fluency in Spanish language; ability to work with Spanish speaking individuals and community members.

Is this project for more than one student: No

Tara White
Department: Behavioral and Social Sciences; Carney Institute for Brain Science; School of Public Health; Watson Institute
Project Type: Research
Project Title: Dignity Neuroscience in Society V

Project Description:
Introduction. Universal human rights are defined by international agreements, law, foreign policy, and the concept of inherent human dignity. However, rights defined on this basis can be readily subverted by overt and covert disagreements and can be treated as distant geopolitical events rather than bearing on individuals' everyday lives. A robust case for universal human rights is urgently needed and must meet several disparate requirements: (a) a framework that resolves tautological definitions reached solely by mutual, revocable agreement; (b) a rationale that transcends differences in beliefs, creed, and culture; and (c) a personalization that empowers both individuals and governments to further human rights protections.

Description. Dignity neuroscience proposes that human rights in existing agreements comprise five elemental types: (1) agency, autonomy, and self-determination; (2) freedom from want; (3) freedom from fear; (4) uniqueness; and (5) unconditionality, including protections for vulnerable populations. We further propose these rights and protections are rooted in fundamental properties of the human brain. We provide a robust, empirical foundation for universal rights based on emerging work in human brain and affective science that we term 'dignity neuroscience'. Dignity neuroscience provides an empirical foundation to support and foster human dignity, universal rights and their active furtherance by individuals, nations, and international law.

UTRA Opportunity. Dignity neuroscience can inform rights and flourishing in people's everyday lives, providing exciting opportunities for multidisciplinary impact and intervention. In this UTRA project, Dr. White and UTRA student(s) will explore and pursue opportunities for dissemination, implementation, and impact within and outside academia. The UTRA will focus on dignity-related innovation in medicine, law, neuroscience, research, outreach/dissemination, and intervention, with focus on biometric prediction of alcohol use, and tailored to the needs and interests of the student(s) and PI.

Required qualifications: N/A

Preferred qualifications: N/A

Is this project for more than one student: Yes

Chuck Toth
Department: Biology Undergraduate Education
Project Type: Course Development
Project Title: Growing Human Brain Organoids for CURE Course in Spring 2026

Project Description:
This fall 2025 Course Development UTRA is looking for an undergraduate interested in human disease research to develop mammalian cell culture skills with a goal to generate human brain organoids for my BIOL0610 CURE course in the spring of 2026. I will be teaching “Modeling Human Disease Using Stem Cells.” The course uses human induced pluripotent stem cells (iPSC) as a tool for students to design and complete their own stem cell research projects. Students this semester developed models using 2D neurons and astrocytes. I would like to introduce brain organoids as a 3D model. Techniques will include iPSC cell culture and differentiation, real-time PCR, microscopy, and protocol development. The UTRA requires weekend work. These skills are also transferrable to a research lab at Brown or in the biotech industry if a student is looking for research, an internship or employment post-Brown.

Required qualifications: N/A

Preferred qualifications: Previous coursework preferred: BIOL0280 OR BIOL0285 OR BIOL0470 OR BIOL1310 OR BIOL0610; Research experience, specifically cell culture experience or aseptic technique preferred.

Is this project for more than one student: No

Roee Gutman
Department: Biostatistics
Project Type: Research
Project Title: Record Linkage with Differing Errors Across Blocks

Project Description:
Identifying records that represent the same entity in the absence of unique identifiers (e.g. social security number) is important for many social, health and policy applications. This is a growing field, because data is produced by multiple sources and each include possibly different information. Probabilistic record linkage methods use partially identifying information available in both files to find records that represent the same entity. These methods usually work even when the information is recorded with errors. However, these algorithm can be computationally intensive. One way to reduce computation and increase accuracy is to use blocks. Blocking require that some variables that appear in both data sources are equal for records that are declared links. However, it is not clear if error in non-blocking variables should be different across blocks or similar for all blocks. In this project we will compare the performance of record linkage methods that allow for differences across blocks and those that do not using simulation

analysis. The project would include programming the methods, and design simulations to compare the performance under realistic scenarios.

Required qualifications: Statistical Inference; Programming

Preferred qualifications: R; Python; C++

Is this project for more than one student: No

Roee Gutman
Department: Biostatistics
Project Type: Research
Project Title: Open Source Software for Linking Individuals in the Absence of Unique Identifiers

Project Description:
Identifying records that represent the same entity in the absence of unique identifiers (e.g. social security number) is important for many social, health and policy applications. This is a growing field, because data is produced by multiple sources, and each includes possibly different information. Probabilistic record linkage methods use partially identifying information available in both files to find records that represent the same entity. Because of the probabilistic nature of the methods, they may lead to false links (define records that represent the same entity when they do not) and missed links (do not define records as representing the same entity when they are). These errors can lead to inaccurate and imprecise estimates. In this project, we will implement statistical methods to link data more accurately and adjust for these errors in downstream analysis of the linked data. The goal is to have a software available for researchers who work with linked datasets.

Required qualifications: Statistical Inference, Computing Course

Preferred qualifications: R,Stan, C++,Python

Is this project for more than one student: No

Ying Ma
Department: Biostatistics, Center for Computational Molecular Biology
Project Type: Research
Project Title: Deep Learning for Temporal Alignment in Spatial Transcriptomics

Project Description:
Spatial transcriptomics (ST) technologies enable the measurement of gene expression across spatial locations in tissue sections, providing insights into tissue architecture and cellular microenvironments. However, most ST studies capture static snapshots, limiting our understanding of dynamic biological processes such as development, disease progression, and tissue regeneration. This undergraduate research project offers students the opportunity to explore deep learning methods for aligning spatial

transcriptomics datasets collected across multiple time points. The primary goal is to investigate how spatial and temporal information can be jointly modeled to reconstruct spatio-temporal trajectories of cellular states. Students will begin by analyzing publicly available ST datasets with annotated time points (e.g., developing mouse organs or regenerating tissues). They will explore neural network-based models, such as autoencoders, graph neural networks, and sequence models (e.g., RNNs or Transformers), to learn spatial embeddings and align them over time. If feasible, we will propose and develop a novel method or model variation tailored to the spatio-temporal alignment task. If completed successfully, the project may lead to a co-authored publication in a scientific journal. This project is ideal for students interested in computational biology, deep learning, and applying technical skills to address neuroscience-related questions. Beyond working on the project, students will be expected to attend weekly lab meetings and provide regular updates to the PI and other team members. Students will also have opportunities to collaborate with other members of the Ma Lab. For more information about our collaborative and interdisciplinary lab, please visit: https://yingma0107.github.io/
References:
[1] Ying Ma and Xiang Zhou, Spatially informed cell type deconvolution for spatial transcriptomics, Nature Biotechnology 2022
[2] Ying Ma and Xiang Zhou, Integrative and Reference-Informed Spatial Domain Detection for Spatial Transcriptomics, Nature Methods 2024
[3] Klein, D., Palla, G., Lange, M. et al. Mapping cells through time and space with moscot. Nature 638, 1065–1075 (2025). https://doi.org/10.1038/s41586-024-08453-2

Required qualifications: Strong programing language ability (preferably in python and/or R) Experience working with GitHub for version control and code collaboration Basic proficiency with UNIX/Linux command-line environments Completion of coursework in the following areas: deep learning, Linear algebra, Statistics

Preferred qualifications: Experience using PyTorch or TensorFlow for deep learning model development
Background in graph-based models (e.g., Graph Neural Networks) or autoencoders
Experience with data visualization (e.g., Matplotlib, Seaborn, ggplot2)
Strong written and verbal communication skills for presenting and discussing scientific results

Is this project for more than one student: Yes

Neil Sarkar
Department: Brown Center for Biomedical Informatics
Project Type: Research
Project Title: Structuring Ancient Ayurvedic Food Therapies for Contemporary Health Applications

Project Description:
Are you curious about how ancient medical traditions can inform modern health care? This project offers the opportunity to explore Ayurveda, a traditional system of medicine from India that emphasizes individualized care, balance among bodily systems, and the use of food and lifestyle for therapeutic purposes. As part of a broader research program focused on bridging the therapeutic uses of food from ancient medicine frameworks to modern clinical practice, this project invites you to contribute to the structuring of traditional knowledge for contemporary clinical application.
You will work closely with me to identify and annotate food-based therapies described in classical

Ayurvedic texts, focusing on those with potential relevance to chronic conditions such as metabolic syndrome, cardiovascular disease, and gastrointestinal disorders. Using biomedical informatics and data science methods, you will help organize and map these therapies to modern clinical concerns and standardized health vocabularies such as SNOMED CT and FoodOn.
Your responsibilities will include reviewing English-translated Ayurvedic texts, applying structured annotation strategies, mapping food items to controlled vocabularies, and contributing to the development of a knowledge base designed to support future clinical decision-making algorithms.
This hybrid project involves weekly virtual check-ins and in-person meetings at least once every three weeks. It is well-suited for students interested in biomedical informatics and data science, public health, global medicine, nutrition science, or the cultural dimensions of medical knowledge. No prior experience with Ayurveda or informatics is required. However, students are expected to be intellectually curious and willing to learn both basic data science and informatics techniques as well as foundational concepts from ancient Ayurvedic medical practice.
By participating in this project, you will gain experience in transdisciplinary research, knowledge representation, and the transformation of ancient healing systems into tools for modern healthcare delivery. This is a unique opportunity to engage with the intersection of ancient wisdom and contemporary science.

Required qualifications: Strong written and verbal communication skills; Careful attention to detail and ability to follow structured protocols; Demonstrated interest in health, medicine, nutrition, or related fields; Ability to read and synthesize complex textual material; Ability to work independently and meet regular deadlines; Enrollment in at least one prior course involving critical reading, writing, or analysis (e.g., humanities, social sciences, life sciences, or data science)

Preferred qualifications: Coursework or experience in health informatics, public health, global health, or nutrition science;
Familiarity with traditional or non-Western medical systems (e.g., Ayurveda, Traditional Chinese Medicine);
Prior experience with literature review, annotation, or data curation;
Demonstrated ability to conduct interdisciplinary research or work across cultural contexts;
Interest in the role of food and lifestyle in chronic disease prevention and management

Is this project for more than one student: Yes

Zhuqing Li
Department: Brown University Rockefeller Library
Project Type: Research
Project Title: John Hay's China Policy

Project Description:
This project seeks to utilize the extensive John Hay archives at Brown University to conduct a deep and multifaceted examination of the pivotal moments in U.S.-China relations. It seeks to uncover new insights into these historical events, focusing on the formulation and impact of the Open Door Policy and the aftermath of the Boxer Rebellion. The UTRA student researcher will help search and collect relevant material for a collaborative project that involves scholars from a range of disciplines to collaboratively explore and reinterpret the nuanced narratives embedded within these invaluable archives.

Required qualifications: Interest in historical research, knowledge of the history of the US-China relationship in the 19th and 20th centuries, reading knowledge of the Chinese language

Preferred qualifications: knowledge and interest in the US-China relationship at the turn of the 19-20 century

Is this project for more than one student: Yes

Frederike Petzschner
Department: Carney Institute for Brain Science; Cognitive and Psychological Sciences
Project Type: Research
Project Title: Embodied Rewards: Interoception, Emotion, and Learning from the Inside Out

Project Description:
The Perception, Action, and Cognition (PeAC) Lab investigates embodied intelligence—the fundamental role the body plays in shaping how we feel, decide, and learn. For this Fall 2025 UTRA, we invite a motivated undergraduate to join an exciting research project on interoception, the perception of internal bodily states, and how it influences reward-based learning and emotional experience.

This project will explore how people learn from rewards and punishments, how bodily signals shape this learning process, and how these dynamics connect to emotions. The student will help develop and program a novel behavioral task designed to probe reward and punishment learning, assist in the collection of both EEG and behavioral data, and contribute to the analysis of these multimodal datasets.

This is an ideal opportunity for students curious about the neuroscience of decision-making, the physiology of emotion, and the mind-body connection. Our interdisciplinary approach bridges psychology, cognitive science, neuroscience, and computer science.

Student Role & Learning Outcomes:
The student will:
- Contribute to the design and programming of a learning task (in JavaScript)
- Assist in EEG and behavioral data collection with human participants
- Perform data preprocessing and analysis, including signal processing and behavioral - modeling (in MATLAB, Python, or R)
- Gain hands-on experience with experimental methods in cognitive neuroscience
- Participate in weekly lab meetings and one-on-one mentorship to support project planning, critical thinking, and scientific communication

Required qualifications: Prior programming experience in one or more of the following: JavaScript, MATLAB, Python, or R

Preferred qualifications: - Prior programming experience in one or more of the following: JavaScript, MATLAB, Python, or R
- Interest in neuroscience, psychology, cognitive science, or human-computer interaction
- Motivation to engage with human participants and hands-on experimental procedures

- Strong attention to detail, curiosity, and a collaborative mindset
- Willingness to learn new tools (e.g., EEG acquisition software, signal analysis techniques)

Is this project for more than one student: No

Elizabeth Aston
Department: Center for Alcohol and Addiction Studies
Project Type: Research
Project Title: Project MATEY: MArijuana and Tobacco in Emerging Young adults

Project Description:
Young adulthood is a crucial period for understanding the development of substance use disorders, which can lead to the development of cancer later in life. Two substances in particular, marijuana and tobacco, are of critical importance due to their prevalence and potential impact on this vulnerable age group. Marijuana use has reached critically high rates in young adults, and the majority of young adults endorsing marijuana use also smoke tobacco. Dual use of both substances is associated with a greater risk of health and behavioral problems later in life. However, behavioral mechanisms underlying marijuana and tobacco dual use are not well characterized. Novel methods and experimental data are urgently needed to better model and understand behavioral mechanisms underlying young adult dual use of marijuana and tobacco in order to reduce cancer risk across the lifespan. We propose to characterize young adults who smoke of marijuana and cigarettes (YASMCs) using rigorous laboratory-based behavioral economic measures: a novel cross-price elasticity of demand (CPED) task we have developed and an innovative extension of cue-induced demand to assess cross-cue reactivity. CPED can tell us how demand for one substance may shift as the price and availability of another substance changes in a model that approximates real-world tradeoffs. If these substances act as substitutes for an individual, then as the value of one decreases, demand for the other increases. In this case, cessation efforts aimed at one substance may lead to increases in use of the alternative substance. If they are complements, increasing access and exposure to one substance may drive a concomitant increase in demand for the alternative substance. Cross-cue induced demand can tell us the extent to which environmental cues (e.g., smoke, drug paraphernalia) can elicit elevated demand for the alternative substance in the moment. Thus, increased exposure to drug-specific cues could lead to unintended harms such as increased craving for both substances. Participants (N = 120) will be young adults (age 18-25) endorsing current tobacco and marijuana use and will complete 4 experimental sessions: one in which they will complete baseline assessments and the CPED task, 3 cross-cue reactivity sessions (cigarette cues, marijuana joint cue, and “blunt’ or mixed tobacco and marijuana cue; each precede by neutral cues in a single session), and a qualitative exit interview about modes of cannabis and tobacco use. Outcome measures will include: 1) degree of substitutability on the CPED, 2) change in demand for each alternative substance in the presence of target-substance cues, and 3) relationships between these outcomes and other measures of dual use.

Required qualifications: Experience with Microsoft programs (e.g., Excel, Word, PowerPoint)

Preferred qualifications: Experience working with human subjects, data collection, and/or with software to be used in the study (e.g., Qualtrics, NVivo, SPSS). *Not required; all necessary skills can be trained

Is this project for more than one student: Yes

Elizabeth Aston
Department: Center for Alcohol and Addiction Studies
Project Type: Research
Project Title: BEST: The Behavioral Economic Study of MicroTransitions

Project Description:
Heavy cannabis use among young adults (YA) is related to potential deleterious long-term effects and myriad other cannabis-related problems. Notably, young adulthood is characterized by frequent, smaller-scale transitions (i.e., micro-transitions) and critical life events that can lead to an escalation or reduction in cannabis use, likely depending on their subjective evaluation (i.e., valence). Certain transitions may increase cannabis use frequency (e.g., college entrance), while others may be protective (e.g., marriage). A behavioral economic (BE) framework can help explain how micro-transitions during young adulthood influence prospective changes in cannabis use. BE domains are influenced by internal (e.g., craving) and external (e.g., new employment) influences and include (1) access to and preference for alternative reinforcers (i.e., lack of alternative activities that compete with cannabis), (2) discounting of delayed rewards (i.e., inordinate preference for smaller immediate rewards, such as positive cannabis effects), and (3) relative cannabis value (i.e., demand; willingness to pay prohibitively high prices for cannabis despite limited resources or income). Further, motives for cannabis use (e.g., coping, enhancement) are key variables that likely account for the relation between micro-transitions and changes in cannabis use among YA as well. There is a dearth of prospective data on the association between the experience of micro-transitions and cannabis use, and no data on potential mechanisms, such as BE domains or use motives, that may account for this relationship. In this regard, the proposed research will employ a prospective mixed-methods design with YA who use cannabis to assess micro-transitions, cannabis use behavior, BE domains, and cannabis use motives over time. YA who endorse cannabis use (18-25 years; N = 400) will complete a 3-year observational survey study examining motives and BE mechanisms that underlie micro-transitions and cannabis use changes.

Required qualifications: Experience with Microsoft programs (e.g., Excel, Word, PowerPoint)

Preferred qualifications: Experience working with human subjects, data collection, and/or with software to be used in the study (e.g., Qualtrics, NVivo, SPSS). *Not required; all necessary skills can be trained

Is this project for more than one student: Yes

Jane Metrik
Department: Center for Alcohol and Addiction Studies, School of Public Health
Project Type: Research
Project Title: Cannabis' Impact on Alcohol Consumption (Project MARS)

Project Description:
Cannabis is the most common psychoactive drug co-used with alcohol, although evidence regarding whether cannabis reduces or increases drinking is mixed. Our research has demonstrated that

Δ-9-tetrahydrocannabinol (THC) acutely reduces alcohol consumption in heavy cannabis and alcohol co-users under controlled laboratory conditions. An important gap in current clinical research is lack of human laboratory studies that examine alcohol consumption in relation to cannabis varying in cannabinoid composition (THC and CBD). Moreover, no previous study has evaluated the impact of cannabis on alcohol use within the same individual under both controlled laboratory conditions and in the natural environment. This FDA placebo-controlled randomized clinical trial involves cannabis and alcohol administration to participants in our smoking laboratory and a simulated barlab at Brown. This project provides the most comprehensive tests of the impact of cannabis on alcohol outcomes using a multi-method design: (1) controlled laboratory administration of THC versus CBD smoked alone versus simultaneously with alcohol and (2) ecological momentary assessment (EMA) of contextual factors that can help explain the associations between cannabis use and alcohol-related outcomes in daily life contexts in 200 heavy alcohol drinkers who use cannabis at least weekly. Data from the laboratory phase will be integrated with smartphone-based data on cannabis use patterns, context, alcohol craving, consumption, and consequences collected from the same individuals over a 4-week EMA period. This research has important implications for cannabis regulatory science and alcohol treatment by addressing the relative impact of specific cannabinoids as well as contextual risk in cannabis-alcohol co-use. The student will have the opportunity to work with both people and data. Sample activities in the lab: participant recruitment, phone screening, maintaining study databases, tracking participant data in real-time, coding interview data, and assisting with the laboratory experimental sessions.

Required qualifications: Knowledge of Microsoft Suite (Word, Excel, PowerPoint) and Google Suite (Gmail, google calendar, google voice, google drive); strong communication and interpersonal skills, excellent organizational skills, attention to detail, maturity and responsibility, ability to work independently and as part of a team. Must be available to work onsite at Brown University.

Preferred qualifications: Research experience (especially with human subjects) and psychology or public health coursework is preferred but not required. Comfort working with research participants and discussing substance use. All skills can be trained.

Is this project for more than one student: Yes

Jane Metrik
Department: Center for Alcohol and Addiction Studies, School of Public Health
Project Type: Research
Project Title: Cannabis Health Messaging: How Does it Influence Cannabis Use?

Project Description:
The majority of US states have adopted legislation to medically and/or recreationally legalize cannabis, including Rhode Island, and cannabis use prevalence and ease of access are on the rise. Public perception of the drug is now overwhelmingly favorable and many people perceive cannabis to have low health risks and to even have therapeutic benefits. Aside from evidence for symptom relief in certain medical conditions, evidence regarding therapeutic effects of cannabis remains elusive, leaving the decision regarding when and how to use cannabis to the user. Both therapeutic and recreational reasons for use are shaped through exposure to messages about the effects of cannabis, yet little is known about the source of messaging, how it is transmitted to users, how it shapes their thinking, and ultimately its association with cannabis use patterns. For example, messages about cannabis's effectiveness for pain,

sleep troubles, or anxiety may be perceived differently depending on if it is coming from a friend, a budtender at a retail cannabis outlet, or a post on Reddit. The proposed study will gather information from individuals who use cannabis about message sources, cannabis-promoting content, and risk warnings being disseminated to cannabis users, and how these factors relate to cannabis use itself. It will also examine characteristics of the cannabis itself, such as form, mode, THC content, and terpenes.

This study uses a series of daily smartphone surveys to examine cannabis use, reasons, and messaging in addition to online surveys and interviews spanning several months. 300 participants age 18-74 year-old who are weekly cannabis users will be recruited from the community. In-person orientations will be conducted prior to data collection. The ultimate goal of the study is to provide information to individuals who are making decisions about what types of cannabis to use and what conditions to use it for.

Required qualifications: Knowledge of Microsoft Suite (Word, Excel, PowerPoint) and Google Suite (Gmail, google calendar, google voice, google drive); strong communication and interpersonal skills, excellent organizational skills, attention to detail, maturity and responsibility, ability to work independently and as part of a team. Must be available to work onsite at Brown University.

Preferred qualifications: Research experience (especially with human subjects) and psychology or public health coursework is preferred but not required. Comfort working with research participants and discussing substance use. All skills can be trained.

Is this project for more than one student: Yes

Michelle Quay
Department: Center for Language Studies
Project Type: Research
Project Title: Kirkor Minassian & Collecting Persian Manuscripts in America c. 1900 - 1937

Project Description:
This Fall 2025 UTRA, entitled “Kirkor Minassian & Collecting Persian Manuscripts in America c. 1900 - 1937” is part of a larger research project which aims to properly identify Persian manuscripts held in the John Hay Library as part of the Minassian Collection. These manuscript pages, particularly the illuminations, have been removed from their original context to be sold as individual pieces for the art market. As such, their connections to their historical provenance have been lost, and many of them are unfortunately mislabelled and misidentified within the existing catalog. This project aims to reunite these stranded artworks with their manuscripts of provenance, even if only in digital form, and reintroduce them into the global scholarly conversation surrounding important literary works, such as the 11-century epic poem, the Shahnameh. It also aims to investigate how these artworks were deconstructed -- often literally cut into pieces -- and then reconfigured to appeal to Western buyers’ tastes. This UTRA in particular will focus on researching the collection in the John Hay Special Collections Library and finalizing the library’s finding aid, to make this collection more accessible to researchers.

The current website for the Minassian Collection is available here:
https://library.brown.edu/cds/minassian/

Applicants need not have direct experience in working with manuscripts. However the student should

have basic proficiency in written Persian and should be prepared to learn how to consult primary historical sources from the early modern and premodern periods, with weekly instructor guidelines and discussion. The research will take the form primarily of reading, summarizing, and tracking down possible source manuscripts for individual illuminations or pieces of calligraphy. The student will also be asked to identify catalog entries that contain errors and need to be re-written. The outcomes of their research will be incorporated into a newly updated library catalog for the Minassian Collection.

Required qualifications: N/A

Preferred qualifications: Basic knowledge of written Persian. Knowledge of research database use and searching techniques. Strong organizational skills. Familiarity with archival work.

Is this project for more than one student: No

Tarana Chauhan
Department: Center for Philosophy, Politics, and Economics
Project Type: Research
Project Title: Female labor force participation in Asia

Project Description:
The undergraduate RA will work on two distinct research projects studying women's labor force participation in India, Bangladesh and Cambodia.

The first involves analyzing a high frequency panel data of female garment workers in India, Bangladesh and Cambodia. Information about their labor supply, wages, consumption and health are measured on a weekly basis. The student will assist in cleaning and analyzing this data, visualization, reviewing relevant literature, and contributing to the drafting of policy briefs.

The second project is a field experiment that studies the problem of worker matching and retention in the manufacturing sector in northern India. This project includes multiple lab-in-field experiments studying migrant female workers in this sector. The student will contribute by developing survey instruments, cleaning and analyzing collected data, generating variables, and preparing a policy report summarizing the findings for collaborators. The student will also engage in a literature review related to similar lab-in-field experiments.

The RA will split their time between the two projects based on project needs, skills, and interests. The position offers opportunities to develop skills in data analysis, coding, and academic writing. Students should include their prior research experience and attach a sample code using any programming language that demonstrates their skills in dataset creation, cleaning, and analysis.

Required qualifications: 1) Proficiency in STATA; 2) Coursework in applied research methods, mathematics, computer science, or data analytics

Preferred qualifications: 1) Experience with R OR Python
2) Familiarity with field experiments,or panel data analysis

Is this project for more than one student: No

Amit Basu
Department: Chemistry
Project Type: Research
Project Title: What's in a name? Well, a lot, it turns out - some chemistry, biology, history, and linguistics, to be more precise.

Project Description:
Bird droppings and DNA; Goat's milk and sutures; Butter and Zippo lighters - seemingly disparate pairings, yet linked chemically and etymologically. This project delves into the history of common names of organic molecules. There are two primary objectives to this work – 1) scientific communication in the classroom and beyond to explain and popularize everyday science; and 2) generation of the histories of both chemical etymologies and chemical processes and theories. The work involves a deep dive into the primary chemical literature, largely from the 19th century. This project lies at the intersection of chemistry, history, and language, and the work coming out of this project can be used for continued development of Chem 0910 (The Language of Chemistry) as well as contribute to a variety of courses in Chemistry.

Required qualifications: Chem 0350 - A basic understanding of fundamental organic transformations is required.

Preferred qualifications: Rudimentary knowledge of French and/or German in order to translate key passages into English is helpful but not required.

Is this project for more than one student: No

Emily Sprague-Klein
Department: Chemistry
Project Type: Research
Project Title: Plasmon-Driven Photochemistry

Project Description:
The purpose of this project is to detect biomimetic analytes in artificial light-harvesting systems. The student will learn about photochemistry in the environment and how nanotechnology plays a role in organic photovoltaic technologies by using modern methods in optics, sensing, and data analysis. The research project focuses on probing the light-harvesting mechanisms in artificial chlorosomes or pigment aggregates that mimic the natural photosynthetic antenna in green sulfur bacteria. We aim to use these biomimetic bacteriochlorophyll compounds in bio-degradable nanoparticle oligomers for site-specific treatment of diseased cell apoptosis with photodynamic therapy (PDT) and other biophysical applications.

Required qualifications: 1 semester of Physical Chemistry

Preferred qualifications: data analysis, general chemistry, thermodynamics, nanoscience

Is this project for more than one student: No

Brenda Rubenstein
Department: Chemistry, Physics, Data Science Institute
Project Type: Research
Project Title: Modeling Biology on a Quantum Computer

Project Description:
Understanding the interactions between biomolecules and chemical compounds is crucial for developing new disease therapeutics, exploiting bio-inspired energy transport in photosynthesis, and harnessing the power of correlated electron chemistries in enzymes. Doing so requires modeling the dynamics of complex biological systems in aqueous solution. A crucial technological gap that prevents us from achieving this goal is that currently available molecular dynamics simulations employ coarse and often inaccurate force fields. Indeed, gaining access to information about bond breaking, bond formation, and the subtle manifold of energy states involved in enzymatic catalysis requires bridging molecular motions with a sufficiently accurate description of the electronic degrees of freedom at play. However, this can be highly computationally demanding on classical computers, and even beyond the reach of the largest supercomputers available. Utilizing the advantages of quantum computers presents a promising opportunity to significantly reduce the cost while significantly increasing the accuracy of electronic calculations for increasingly large systems. As part of this project, we will develop a combination of machine learning, classical electronic structure, and quantum algorithms to model biomolecular systems in atomistic detail on quantum computers for the first time. Students involved with this project will either be involved with studying specific biochemical systems (e.g., RNAs, kinases, covalent inhibitors), developing the neural networks needed to integrate quantum computed results into classical force fields, applying electronic structure algorithms, or developing novel quantum computing algorithms to best model these systems on currently available hardware. Students interested in this project can find more information at the Wellcome Leap Quantum4Biology website or on our group website (rubenstein.group). We are happy to invite any interested students to meet with us or attend our weekly group meetings.

Required qualifications: Knowledge of Quantum Mechanics at the undergraduate level, familiarity with biochemistry, familiarity with coding

Preferred qualifications: N/A

Is this project for more than one student: Yes

Brenda Rubenstein
Department: Chemistry, Physics, Data Science Institute
Project Type: Research
Project Title: Launching the HumanRNAome Project at Brown

Project Description:

The human genome project transformed biology and health by providing researchers unprecedented access to genetic sequences. But, sequencing RNA lags far behind because of the many different chemical forms RNA assumes. Thus far, no human RNAome project has yet been launched. But, Brown aims to start this potentially transformative work. In this project, you will help us launch this project by developing the first RNAome databases, servers, and websites. Students interested in the biochemistry will also help with sequencing and related sequence analysis. This project will cross the biological and data science disciplines.

Required qualifications: Programming, some data science skills, knowledge of biology (at least Introductory Biology courses such as Genetics)

Preferred qualifications: Database maintenance, backend work, an understanding of RMA

Is this project for more than one student: Yes

Daphna Buchsbaum
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: How do children think and learn about the physical and social world around them?

Project Description:
Our lab conducts cognitive development research on a variety of topics within children's thinking and learning, with a particular focus on how young children learn about categories such as colors and animals, how they understand cause and effect relationships, and on how they learn socially (both from and about other people). As an undergraduate researcher, you will have the opportunity to participate in all aspects of research in the lab. This includes assisting with conducting in-person and online behavioral experiments with children, coding and transcribing data, updating lab materials, contributing to participant newsletter and lab social media, and recruitment and scheduling of child participants (aged 3 - 9), in person and over phone and email. Our research takes the form of short, interactive games that are designed to be fun and engaging to children. We record children's actions when interacting with others, toys and puzzles, and the choices they make, to learn more about their understanding of the world. This opportunity will require the student(s) to commit about 8-10 hours/week to the lab. Regular weekend hours are required, as this is when children are most often available to participate. You can learn more about our research at www.cocodevlab.com. For brief meetings with the lab manager to discuss our research, please email manager-buchsbaum@brown.edu with the subject [SPRINT Research Opportunity].

Required qualifications: Commitment to work in the lab for at least 2 semesters/terms. This is necessary due to the training and learning curve necessary to assist with research with child participants; Be able to commit some regular weekend and some evening hours (this is when children are most often available to participate); Previous experience working with children (in a research or non-research capacity); Previous coursework in psychology, development, and/or cognition.

Preferred qualifications: Previous recruiting or customer service experience (either formal or informal); Previous research experience; Experience with statistics, programming or web design; Access to a computer and stable internet access capable of running online experiments via Zoom.

Is this project for more than one student: No

Daphna Buchsbaum
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: How do dogs think and learn about the physical and social world around them?

Project Description:
Our canine cognition research explores dogs' learning and reasoning abilities. We investigate dogs' learning in a variety of contexts including dogs' physical problem-solving abilities (e.g., how to get treats out of puzzles) and their understanding of social information (e.g., following a pointing gesture or learning from a demonstration). Our research takes the form of short, interactive games and training exercises that are designed to be fun and engaging to dogs. We record dogs' actions when interacting with people, toys, and puzzles, and the choices they make, to learn more about their understanding of the world. As a research assistant, you will have the opportunity to help with conducting online and in-person behavioral experiments with dogs, coding of behavioral experiments, inputting and assisting with data collection, and recruitment of canine participants and their owners. This opportunity will require the student(s) to commit about 8-10 hours/week to the lab (including some weekend and evening hours as this is when owners and their dogs are most often available to participate). You can learn more about our research at sites.brown.edu/browndoglab. For brief meetings with the lab manager to discuss our research, please email manager-buchsbaum@brown.edu with the subject [SPRINT/UTRA Research Opportunity].

Required qualifications: Commitment to work in the lab for at least 2 semesters/terms. This is necessary due to the training and learning curve necessary to assist with research with dogs; Be able to commit regular weekend and some evening hours (this is when owners and dogs are most often available to participate); Previous experience interacting with dogs (either formally or informally); Previous coursework in psychology, animal behavior and/or comparative cognition.

Preferred qualifications: Previous experience working with dogs (in a research or non-research setting) is highly desirable; Previous recruiting or customer service experience (either formal or informal); Previous research experience; Statistics, programming or web design experience (a bonus but not required); Access to a computer and stable internet access capable of running online experiments via Zoom.

Is this project for more than one student: No

David Levari
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Measuring trust, listening, and learning with human and machine advisors

Project Description:
Humans often need to learn how to do new tasks and get better at old ones, and we have more ways

than ever to do so, ranging from courses and advice from mentors to online searches and queries to generative AI models such as ChatGPT. What are the hidden mechanisms of learning from these difference sources to maximize performance in the classroom, the athletic field, and the operating room? How do classic quirks of human cognition such as overconfidence and social heuristics lead us to reject advice we should follow, and heed advice we should ignore? Can new tools such as AI-assisted translation improve the reach and efficacy of the most useful advisors across domains? Our research uses lab, field, and online experiments and computational modeling to answer these questions about some of the biggest mysteries of human behavior. Students are involved at every level of the research process, including designing behavioral studies, reading articles, administering experiments and collecting data, background research, and data analysis. We will teach you how to do each these things as needed, so no prior experience is required. This opportunity will require the student(s) to commit about 10 hours/week to the lab. The project is ideal for students interested in getting first-hand experience in behavioral science research, fields such as data science or AI, and for those considering graduate school in psychology, economics, computer science, political science, marketing, organizational behavior, or related disciplines. For more information: https://davidlevari.com/

Required qualifications: N/A

Preferred qualifications: Experience with web and app development to creative interactive online tasks and web interfaces for research (e.g. javascript, HTML5, react) is always nice, but not at all required.

Is this project for more than one student: Yes

David Levari
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Programming and web development (make games for behavioral science!)

Project Description:
Behavioral science research is increasingly online and requires cutting-edge web-based tools to study human behavior. For our work on understanding how people collaborate and learn how to play games, we could use a student with experience in web-design (user-facing) and creating online and offline games that can be used in human psychology experiments. This might include recreating classic games (Boggle, Tetris, Farming/Mining Sims) or creating entirely new ones where data can be collected online and stored in our servers. The expectation is that the position will involve 10-12 hours/week assisting the project, on campus or remotely. For more information about our research, please see https://davidlevari.com/.

Required qualifications: Previous web development experience to create interactive web-based games or tasks such as Javascript, HTML5, React, Node.js, etc.

Preferred qualifications: Experience with project management via Git, mySQL nice but not required.

Is this project for more than one student: No

Joo-Hyun Song
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Perceptual enhancement related to action preparation

Project Description:
When sitting at a breakfast table and wanting to drink coffee, you will need to perceive the coffee mug and encode its location, shape and orientation in order to grasp it correctly. This typical example shows that most of our behaviors emanate from a close interrelation between perception, action and cognition and that perception will enhance action. The project we propose explores the reverse phenomenon: how action influences perception. We aim to investigate whether action preparation can enhance the perception of a visual target and if so, how? Specifically, we are interested in understanding 1) What type of action (e.g., reach and grasp actions, pointing actions, button presses…) will enhance perception and 2) What are the perceptual features that will be enhanced by action. In the experiment conducted, participants will see different visual objects and will perform different actions toward them (button presses, pointing or grasping movements…). We will use continuous action tracking, a cutting-edge method which will allow us to record many different action parameters over time. This technique is a much more precise and ecological approach to action than traditional behavioral methods. Overall, this research project offers an outstanding opportunity for undergraduate researchers to gain experience with mechanisms supporting the interaction of perception, action and cognition. They will gain experience with different aspects of research that are fundamental in the cognitive neuroscience field, such as experiment programming, human participant testing and data analysis. of behavioral and action tracking data.

Required qualifications: A minimum of 1 semester research or course experience in psychology/biomedical sciences is required.

Preferred qualifications: Prior experience working with human research participants is preferred. Introductory knowledge of statistics and/or programming is a plus but not required.

Is this project for more than one student: No

Joo-Hyun Song
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: How does visual noise modulate motor learning?

Project Description:
Visuomotor adaptation describes our ability to overcome changes in the environment that disrupt the outcomes associated with a well-learned motor behavior. In the lab, we often ensure that visual feedback is tightly controlled. Thus there is less research on how we process noisy visual information in these kinds of tasks, despite some work suggesting that noise may facilitate exploration and improvements in learning. This project will investigate the role of noise in visual feedback and the cognitive mechanisms that underlie individual differences often observed in sensorimotor tasks using combined eye- and reach-tracking methods. Noise may either facilitate or interfere with visuomotor adaptation. Additionally, it is unclear which of two well-established processes (explicit vs implicit) modulate this learning. We aim to

examine these processes as well using modifications of our tasks.

Our ongoing research will explore how different visuomotor learning contexts, such as those where visual feedback associated with reach movements is delayed or unreliable, may change the relationships between cognitive effort and learning rates. We are also interested in the visual statistics that subjects use to guide their motor learning. This research project offers an outstanding opportunity for undergraduate researchers to gain experience with cutting-edge physiological recording methods and learn how this physiological data is used to establish brain-behavior relationships. Mentees will also gain initial experience with programming and computational methods that are fundamental in cognitive neuroscience research.

Required qualifications: A minimum of 1+ semester(s) research or course experience in psychology/biomedical sciences is required.

Preferred qualifications: Experience working with human research participants in a laboratory setting is preferred. Introductory knowledge of programming and/or statistics is a plus, but not required.

Is this project for more than one student: No

Julia Marshall
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: How do children think and learn about morality?

Project Description:
The Mind & Morality Lab is a new developmental psychology lab at Brown whose research focuses on understanding the psychological roots of human morality. As adults, we hold strong convictions about what is right and what is wrong. In the lab, we hope to understand the extent to which certain moral beliefs and behaviors can be traced back to early emerging tendencies in childhood. To do so, we conduct psychological research studies with both children and adults. We approach our research questions through an interdisciplinary lens, drawing on philosophical, legal, and psychological perspectives. Undergraduate researchers in the M&M lab will have the opportunity to participate in all aspects of the research process, including but not limited to: attending regular lab meetings (Tuesdays 12-1 PM), assisting with conducting in-person and online experiments with children, coding and transcribing data, updating lab materials, contributing to lab social media, recruiting and scheduling child participants (aged 5 - 12) in person and over phone and email, and brainstorming new approaches to developmental social psychology research. This opportunity will require the student(s) to commit about 8 hours/week to the lab. Regular weekend hours are required, as this is when children are most often available to participate. You can learn more about our research at https://sites.brown.edu/mindmoralitylab/. For brief meetings with the lab manager to discuss our research, please email mindmoralitylab-manager@brown.edu with the subject [UTRA Research Opportunity].

Required qualifications: Prospective research assistants students must have completed at least one course in psychology, development, and/or cognition by the start of the semester for which they are applying to work in the lab. RAs must be able to commit at least 8 hours per week during the regular work week (9 AM - 5 PM, M-F), including one hour every Tuesday from 12-1 PM for lab meetings. RAs must

have some regular weekend and evening availability (this is when children are most often available to participate), but any time spent working outside of normal working hours will count towards the weekly hour commitment. RAs must also possess a genuine interest in the lab's research areas.

Preferred qualifications: Previous recruiting or customer service experience (either formal or informal); Familiarity with developmental psychology research methods; Experience with statistics, programming or web design; Access to a computer and stable internet access capable of running online experiments via Zoom.

Is this project for more than one student: Yes

Malik Boykin
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Investigating the Impact of Role Model Identities on Student STEM Engagement

Project Description:
The RISE Lab at Brown University's Department of Cognitive, Linguistic, and Psychological Sciences intends to explore how the identities and narratives within professor background narratives influence college students' perceptions and engagement in STEM fields. This investigation addresses the persistent gender gap in STEM, where women and non-binary individuals are significantly underrepresented and face disparities in career advancement and pay. The project leverages role model theory to examine how professor stories of overcoming obstacles and achieving success in STEM might inspire students, particularly women and underrepresented minorities, to pursue and persist in STEM careers.

Utilizing a comprehensive approach that includes demographic surveys, modified measures of interest in STEM versus non-STEM fields, and analysis of perceived identity compatibility, this study aims to uncover how narratives of success and failure impact student identity formation, role model outcomes, and overall engagement with STEM. The research seeks to highlight the critical role of professors' visibility and relatability in bridging the gender gap in STEM by fostering an environment where diverse students feel a sense of belonging and resilience against stereotypes.

*The RISE Lab values diversity and equality and is committed to creating an inclusive environment for all members. We strongly encourage applications from individuals of diverse backgrounds, particularly those who are underrepresented in STEM fields.

Required qualifications: Required Qualifications: Enrollment in an undergraduate program in psychology, sociology, or a related discipline.; Demonstrated interest in developmental psychology, STEM education, and diversity in academic contexts.; Experience with or willingness to learn data collection and analysis software, including Qualtrics.

Preferred qualifications: Preferred Qualifications: Strong organizational, communication, and teamwork skills.; Ability to commit to the project's timeline and participate in lab activities, including a regular weekly schedule.; Knowledgeable in R and/or SPSS.

Is this project for more than one student: No

Oriel FeldmanHall
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: How do people learn, represent, and navigate complex social networks?

Project Description:
Our lab investigates how humans mentally represent and make decisions in complex social environments. How do individuals track the many relationships in a social network, and what formats of knowledge best support predictions about how information, such as gossip, might spread? We study how people build internal models of social networks from sparse observations and how this knowledge shapes decisions in dynamic contexts. Our research combines behavioral experiments, computational modeling, and real-world social network data to understand the cognitive mechanisms that underlie social decision-making. The current project focuses on the different strategies that people might adopt to learn about relationships in a novel social network, and how that learning process influences later memory. As an undergraduate researcher, you will have the opportunity to analyze existing sets of behavioral data using R and MATLAB. Students may also help code new experimental paradigms, depending on interest and skill level.

Required qualifications: The prospective research assistant must have completed at least one course in psychology, cognitive science, and/or computer science by the start of the semester for which they are applying to work in the lab.

Preferred qualifications: Prior experience working with human research participants is preferred. Introductory knowledge of statistics and/or programming is a plus but not required.

Is this project for more than one student: No

Roman Feiman
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: How do children learn to speak and think?

Project Description:
One of the most remarkable things about humans is our ability to take a finite number of words and use them to generate an infinite number of new meaningful sentences. You may have never heard the sentence, “There are no bears on Mars”, but you have no trouble understanding what it means. Not only can you understand it, you can judge that it is very likely true and make conclusions on that basis: if there are no bears on Mars, that means there are no brown bears there, no bear cubs, no bears climbing Martian trees. How is it so easy for us to understand new sentences and think new thoughts, judge whether they’re true, and reason through to related thoughts and sentences?

Language may be the most obvious way we express and understand complex thoughts, but is it the only way? Does it play a special role in enabling thinking, or is it just how we communicate our thoughts? When kids learn a new word, do they gain the ability to think about a new idea — or do they only learn to label what they could already think about? Exploring these questions means exploring our shared humanity — how all of us can think new thoughts so quickly and productively, and how we communicate those thoughts to each other.

Required qualifications: Strong organizational skills, attention to detail Desire to learn new software programs, with the ability to learn independently Proficiency with Word, Excel, Powerpoint.

Preferred qualifications: Prior experience working in a lab, working with children; Experience conducting independent research, (e.g. an honors thesis project, an independent study) is strongly preferred, but not required; Experience with eye tracking, and knowledge of R, Python, Amazon Mechanical Turk (AMT), CHILDES, CLAN, E-PRIME, Matlab, Filemaker, OSF, and Slack are all preferred but not required.

Is this project for more than one student: Yes

Ruth Colwill
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Assessing behavioral disturbances in development

Project Description:
Subtle changes in behavior can signal aberrations in brain development that can have detrimental consequences for adaptive survival. My lab uses the developing zebrafish to uncover the effects of various anthropogenic challenges on mood, motivation, learning and social behavior. This project will provide the UTRA student with an authentic research experience in which they will learn about disciplinary methods used to develop and validate behavioral assays. Building on our recent work and that of students in my CURE course CLPS 1195 (Life under water in the Anthropocene), the UTRA student will participate in a study of how behavior is affected by its social context. The UTRA student will help develop a research question, design and conduct an experiment, analyze data, learn how to interpret scientific evidence, and contribute to a research paper or conference poster. The UTRA student benefits from this experience in several ways. They become familiar with experimental design and disciplinary practices, learn how to troubleshoot experiments, and strengthen their collaborative and communication skills. They may also be able to share their knowledge as a TA in CPSY 1195 in Fall 2026. For more information about the lab and research schedule, please email ruth_colwill@brown.edu

Required qualifications: Required skills: Commitment to work in the lab for at least 2 semesters. Be available some early evenings and weekends.

Preferred qualifications: Preferred skills: Any coursework with a lab component or equivalent experience; experience handling/working with small animals

Is this project for more than one student: No

Ruth Colwill
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Correlates of Emotional Intelligence in Companion Animals

Project Description:
This study aims to identify correlates of emotional intelligence in companion animals. Across a variety of contexts, species and cultures, we will examine companion animal directed speech (CADS) and human directed attention and attachment (HDAA). The UTRA students will help compile an annotated review of the CADS literature, participate in the development of testable hypotheses and experiment design, collect data, and code and analyze transcripts and videos. By the end of this project, the UTRA students will be able to describe the key findings of the CADS literature, develop testable hypotheses, code speech and video recordings, assess coder reliability, conduct statistical analysis, and draw conclusions from the data. Interested students are invited to email ruth_colwill@brown.edu for more information about the study.

Required qualifications: Availability to work evenings and weekends. Comfortable with animals and talking to unfamiliar people..

Preferred qualifications: Coursework in psychology and linguistics; basic programming skills; willingness to learn new statistical methods; fluency in languages other than English.

Is this project for more than one student: No

Alani Hicks-Bartlett
Department: Comparative Literature and Hispanic Studies
Project Type: Research
Project Title: The Language Debate : Texts and Sources

Project Description:
La questione della lingua—that is, the “language question,” or the “language debate”: An intense and exciting debate attempting to distinguish written literary culture from oral traditions, church-sanctioned communication from the language(s) of the populace, vernacular languages from their classical precedents, while also problematically organizing dialects themselves into hierarchies, or tackling the thorny matter of which texts merit being printed and which do not (just to name a few of the primary areas of tensions), was the ‘questione della lingua,’ a debate with high billing in late medieval and early modern linguistic, historical, political, and literary culture, and in courtly, religious, and secular contexts.

Bridging both research and pedagogical interests, the student selected for this UTRA position will collect and help curate a list of texts that engage with the matter of the debate. We will then code, organize, and evaluate the selected texts, which will primarily focus on the premodern period but will also include contemporary criticism and scholarly reassessments of the debate. Ideally, the student would have some facility reading romance languages (any combination of English, French, Spanish, Italian, and/or Latin), though familiarity with other romance languages could also prove helpful. Expertise and/or an interest in

premodern literature is a particular boon, as is expertise and/or training in linguistics, linguistic anthropology, and sociolinguistics. If the student wishes, we can also discuss pedagogical approaches to this question, as well as collaborate in developing select course materials.

Required qualifications: required, intermediate/dictionary-assisted or higher reading ability in at least two languages: French, Spanish, Catalan, Portuguese, Latin, Italian, English

Preferred qualifications: Past coursework or interest in any combination of: premodern literature (classics, medieval, early modern), premodern history and culture, linguistics, history of the Romance languages, literary sources and texts, church history.

Is this project for more than one student: Yes

Akshay Narayan
Department: Computer Science
Project Type: Research
Project Title: Analyzing Internet CCA Contention

Project Description:
Users' demands for application performance have become increasingly stringent over time. These demands can seem at odds with the decentralized and heterogenous nature of the public Internet. This project is developing techniques to extract both more performance and more predictability from the public Internet. The primary challenge in realizing this vision is an outdated and pessimistic model of resource sharing in the Internet. To enable ease of connection, the original Internet design provided no introspection into the path a given application would traverse, and it split bandwidth resources using aggressive buffer-filling algorithms. However, we hypothesize that this traditional model no longer accurately represents the modern Internet, and that the Internet can support far better performance.

There are multiple sub-projects possible. Please contact me (akshayn@brown.edu) for more info.

Required qualifications: CS300 or equivalent

Preferred qualifications: 1000-level CS systems class (1670, 1680, 1675, 1380, 1390, etc) or equivalent experience

Is this project for more than one student: Yes

Amy Greenwald
Department: Computer Science
Project Type: Research
Project Title: AI Applications of Bilevel Optimization with Deep Learning

Project Description:

In recent years, there have been monumental developments in AI's capabilities, particularly with regard to language and image generation. Many of these developments come down to advances in deep learning. However, AI's decision making prowess, even with deep learning, still leaves much to be desired. Improved decision-making capabilities would impact numerous real-world systems, from optimizing healthcare interventions to scheduling airport operations.

This project concerns AI decision making problems that can be modeled as bilevel optimization, meaning one (inner) optimization problem embedded within another (outer) optimization problem. Bilevel optimization is also sometimes called Stackelberg games, with the outer player as the leader and the inner, as the follower. Examples of bilevel optimization abound: A government sets a taxation policy (the leader) with the understanding that firms will modify their behavior accordingly to maximize their profits (the follower). In supply-chain management logistics, an outer optimizer might choose facility locations, while an inner optimizer might model consumer choice among facilities.

My lab has developed novel approaches to solving bilevel optimization problems / Stackelberg games played between two deep learning networks. The goal of this project is to apply these techniques to real-world problems. For example, the state-of-the-art actor-critic framework involves two deep reinforcement learning networks whose typical dynamics can find a Nash equilibrium. We contend that viewing these networks as playing a Stackelberg game instead would lead to more stable outcomes, and thus increase the efficacy of reinforcement learning. This same idea is applicable to myriad AI techniques, from hyperparameter optimization to meta-learning. We hypothesize that taking a Stackelberg game perspective, and implementing our bilevel optimization algorithms on deep learning networks, could greatly improve AI's decision-making prowess in many real-world domains.

Required qualifications: AI foundations (CS 0410 or similar), Python, linear programming, mathematical sophistication

Preferred qualifications: Jax, Deep Learning (CSCI 1470), Machine Learning (CSCI 1420)

Is this project for more than one student: No

Chen Sun
Department: Computer Science
Project Type: Research
Project Title: Protecting Our Planet with Multimodal Learning

Project Description:
We will look into how machine learning techniques, such as computer vision, multimodal learning, and deep learning, can help protect our planet. Student will work on one of the following two efforts (based on their own preference and discussions with the PI): (1) Learning to recognize wild animals, including birds, mammals, insects, reptiles, and amphibians from visual and audio signals; (2) Learning to accurately predict coastal subsidence (https://sealevel.nasa.gov/understanding-sea-level/regional-sea-level/subsidence/) from InSAR and optical images captured by satellites.

Required qualifications: To meaningfully contribute to the project, we expect students to have taken

computer vision or deep learning.

Preferred qualifications: Passion to applying machine learning to understand and protect our nature; Students who have experience working with audio-visual data, or dense prediction (e.g. semantic segmentation in computer vision) would find the projects easier to get started.

Is this project for more than one student: No

Deepti Raghavan
Department: Computer Science
Project Type: Research
Project Title: Building Efficient Compound AI Applications

Project Description:
We will be building applications on a new research framework in our lab, Alto, a tool with which people can build compound AI applications (e.g., retrieval-augmented-generation systems) in a way so they automatically have good performance when they are deployed. We will be testing the limits of the framework by trying to build new examples as well as improving the usability of the framework.

Read more here: https://deeptir.me/papers/alto_euromlsys2024.pdf

Required qualifications: Taken CSCI 0300, Taken one of: (CSCI 1380, CSCI 1675, CSCI 1670, CSCI 1680, CSCI 1270, CSCI 1650, CSCI 1390)

Preferred qualifications: Experience with software engineering

Is this project for more than one student: No

Diana Freed
Department: Computer Science
Project Type: Research
Project Title: AI and Youth Digital Safety

Project Description:
This project explores the sociotechnical role of artificial intelligence (AI) in facilitating help-seeking behaviors among youth facing threats to their digital safety and well-being. We focus on AI-enabled tools—such as conversational agents, mental health platforms, and resource navigation systems—that aim to offer just-in-time support during moments of vulnerability. Drawing on interdisciplinary approaches at the intersection of computer science, social computing, and mental health, the study foregrounds the lived experiences of young people. To evaluate these systems, we conduct mixed-methods research that combines field deployments, interviews, and behavioral logging to examine how young users engage with AI tools in the wild.

Required qualifications: literature reviews, python, strong communication skills, organizational skills, d

Preferred qualifications: Background knowledge of how to conduct research, AI related coursework

Is this project for more than one student: No

Diana Freed
Department: Computer Science
Project Type: Research
Project Title: Reproductive Health Access and Surveillance

Project Description:
In the wake of the Supreme Court's Dobbs decision, the commodification of medical data exposes individuals seeking reproductive healthcare to legal jeopardy. This study investigates the ease with which third parties can access and exploit intimate health data, including mental health and abortion-related information. Additionally, this research will explore misinformation/disinformation and help-seeking behavior in the context of a changing legal environment. This work will offer critical insights to better educate and protect individuals in this rapidly evolving landscape.

Required qualifications: trong communication and interpersonal skills, ability to work independently and as part of a team, ability to develop rapport with research participants. Qualitative data analysis, experience conducting literature reviews and searches using databases, news articles, websites and social media platforms.

Preferred qualifications: Experience with qualitative methods and analyzing transcript data as well as an interest in technology and policy.

Is this project for more than one student: No

Malte Schwarzkopf
Department: Computer Science
Project Type: Course Development
Project Title: Weenix Rebooted: A New Operating Systems Course for Brown

Project Description:
In Fall 2026, I will teach an entirely new version of the CS department's popular CSCI 1670/1690 course, "Operating Systems". This new iteration of the course will focus on students engaging in semester-long, hands-on development of a teaching operating system that they can actually run on a physical computer (most likely a Raspberry Pi or similar). Starting off with a "dead" piece of hardware, over the course of the semester the students will write a full operating system that can run programs safely side-by-side and supports disk storage and I/O.

The course development project will explore several important aspects for this complete revamp of how

we teach Operating Systems at Brown. The primary focus will be developing a sample teaching OS that runs on ARM64 hardware such as the Raspberry Pi. We will reuse parts of Weenix (the current teaching OS), but we will need to rewrite significant code. During this semester-long effort, we will seek to create the first prototype of the new teaching OS to be used in CSCI 1670/1690 going forward.

As part of the effort, we will also:
* Work on an assignment structure and pedagogical approaches that let students get a taste of realistic operating system development, where they build on their prior work in a semester-long sequence of assignments, without overburdening them.
* Review existing OS courses at other institutions and see what we can learn from them.
* Make notes on future curricular materials and assignment specifications for the first iteration of the course, and develop initial sketches.

Required qualifications: Completed at least one of CSCI 1670/1690/2670, CSCI 1675, CSCI 1680, CSCI 1380.

Preferred qualifications: * Completed CSCI 1670/1690/2670.
* TA'ed or HTA'ed a systems course (CSCI 0300, 0330, 1380, 1650, 1670, 1675, or 1680).
* Interest in pedagogy and education.

Is this project for more than one student: Yes

Nora Ayanian
Department: Computer Science
Project Type: Research
Project Title: Collaborative Perception for multi-robot systems

Project Description:
In a multi-robotic system, perception plays a fundamental role in each robot's ability to plan and act within its environment. The quality and scope of environmental perception directly influence how a robotic agent interprets its surroundings and makes decisions about navigation, obstacle avoidance, and collaboration with other agents. This project aims to leverage distributed robotic perception by enabling multiple robots to work collaboratively, sharing sensor information to construct a more comprehensive and accurate representation of their environment. Through this enhanced collective awareness, the system can significantly improve the ability of each robot to navigate complex, dynamic spaces while avoiding collisions with static and moving obstacles—even those not initially visible to a single robot.

Students participating in this project will gain hands-on experience in building and deploying aerial drones equipped with real-time perception and multi-robot communication capabilities. They will learn to integrate hardware components such as depth cameras, IMUs, and onboard computation units, as well as work with software pipelines for real-time data processing. In parallel, students will explore and implement modern neural network architectures that enable robust perception. By working closely with graduate researchers, students will also be involved in real-world data collection and evaluation. This project offers a unique opportunity for students to apply their knowledge to complex, real-world robotics challenges while also gaining valuable experience in both autonomous systems research.

Required qualifications: Background and Experience with 3D CAD Modeling, C++ programming, Python for computer vision

Preferred qualifications: CSCI 1420: Machine Learning, CSCI 1430: Computer Vision, CSCI 0410: Foundations of AI, ENGN 1740: CAD

Is this project for more than one student: Yes

Ugur Cetintemel
Department: Computer Science
Project Type: Research
Project Title: Augmenting the "Impact Afghanistan" Web Database with AI

Project Description:
This project is building AI features into a website that we have been developing to collect and publish research from various sectors on topics related to Afghanistan post-2021 with a specific focus on women rights and conditions. This website includes current publications from academic institutions, NGOs, media and the UN System, and is a place for multi-sector research to be curated and shared in real-time. Where there is currently no comprehensive search engine to unite reports from various, engaged sectors, this database-backed web-interface will provide a one-stop space for emerging research and documentation on Afghanistan post-2021. We have already built a working website that was launched at the September 2024 UN Summit of the Future. In the next stage of the project, we are going to be enhancing our database with new search and usability features using AI tools.

This project is done in collaboration with Center for Digital Scholarship, Brown University Library, who will be hosting this website, Afghan students and alums at Brown, and UN affiliates.

Required qualifications: Website front-end and/or backend development interest and experience using modern tools, including GenAI services. Interest in socially responsible computing.

Preferred qualifications: UX/UI design, AI/ML.

Is this project for more than one student: No

Ugur Cetintemel
Department: Computer Science
Project Type: Research
Project Title: AI-Augmented Database Systems

Project Description:
We are developing an AI-augmented database system that tightly integrates LLMs and other ML models

to support data-intensive AI applications. Specifically, the students will help to build various components of this new system to enable richer database functionality. A collaboration with the RI Hospital will allow us to access real-world data and use cases that will inform the work.

Students will get deep practical exposure to cutting-edge research and practice at the intersection of databases and AI, which will give them an edge for industry positions, and gain experience in CS systems research, making them more competitive for graduate programs.

Required qualifications: Database or systems coursework/project experience, Strong Python skills.

Preferred qualifications: AI related coursework and project experience, in particular with LLMs and other ML models.

Is this project for more than one student: Yes

Linda Clark
Department: Data Science Institute
Project Type: Course Development
Project Title: Data Engineering in Disguise Course Development

Project Description:
Data Engineering in Disguise is a new course for the Masters in Data Science: Governance Policy and Society. The project will assist the faculty member with the following: Resource Support: Help research and organize course materials to ensure that content is relevant, accessible, and engaging
Assignment Development: Assist in drafting and refining technical assignments and projects that help reinforce key course concepts
Code Examples and Testing: Create supplemental code samples (likely in Python) and assist with testing to ensure assignments work as intended

Required qualifications: Completion of at least one programming course, knowledge of python, Basic understanding of data structures and algorithms Familiarity with database systems like SQL

Preferred qualifications: Completion of a data engineering course.

Is this project for more than one student: No

Thomas Sgouros
Department: Data Science Institute
Project Type: Research
Project Title: Charter schools and public schools. Where is the money?

Project Description:
The number of charter schools in Rhode Island, like elsewhere in the country, has grown substantially in

the past 25 years. How has their growth affected the funding of traditional public schools? Looking specifically at the Providence Public School Department (PPSD), and a small number of other Rhode Island school departments, this project will put a price on the impact of charter schools, by looking at per-pupil costs as well as outcomes, and quantify how those costs have changed in the past 25 years. Some of the charter schools are parts of for-profit corporations, and part of the work will involve comparing the use of funds in for-profit and non-profit schools.

The rise of charter schools has accompanied the rising call for increased efficiency in government spending. With decades of experience behind us, the data now exists to make a compelling statement about efficiency, and this project will attempt to do exactly that with available public data in Rhode Island.

This project can use two students: one to focus on the funding mechanisms for charter schools and the other to focus on the finances of the charter schools themselves.

Required qualifications: N/A

Preferred qualifications: Some experience with data analysis will be very useful. Basic economic concepts are essential but coursework is not required. Having been to school is vital.

Is this project for more than one student: Yes

Ahsan Ashraf
Department: Data Science Institute
Project Type: Research
Project Title: Arbitrariness and Bias in content moderation using large language models (LLMs) on social media platforms

Project Description:
With recent advances in large language models (LLMs), text based content moderation has emerged as a potential use case for social media and other content platforms. Content moderation is an expensive and often fiercely debated topic. There is a delicate balance that needs to be struck ensuring freedom of expression while protecting users and keeping the platform healthy. Historically, content moderation has been performed by individuals (IRL humans) that volunteer their time to review content or machine learning models that have been trained on human decisions to make decisions on whether a piece of content is policy violating. However, recently platforms are employing LLMs for content moderation directly or to label content for use in training machine learning models.

There is very little research on the quality and the robustness of content moderation decisions made by LLMs done outside of these large tech companies. LLMs are prone to hallucinations and decisions made by LLMs can be very sensitive to prompts. This research aims to help us better understand the limitations of LLMs and identify potential pitfalls in using these technologies for automated content moderation decision-making.

Required qualifications: Deep learning and understanding of fine-tuning large language models

Preferred qualifications: Research experience within the domain of large language models and deep

learning

Is this project for more than one student: No

Eunyoung Cho
Department: Dermatology
Project Type: Research
Project Title: Epigenetics and psoriasis

Project Description:
We are seeking motivated undergraduate students with an interest in bioinformatics and epigenetics to join a research project investigating the role of epigenetic aging in psoriasis (PsO). This project builds on existing research that has identified accelerated aging in PsO patients. Students will have the opportunity to contribute to cutting-edge research that could provide critical insights into how epigenetic markers predict disease progression, inflammation, and aging in PsO patients. This is a valuable opportunity for students to engage in real-world research and develop skills in data analysis, scientific writing, and presenting at academic conferences. This project offers a comprehensive experience in epigenetic research with the potential for significant academic and professional growth.

Required qualifications: Students with experience or coursework in bioinformatics, computational biology, or a related field are encouraged to apply. Familiarity with statistical software (e.g., R, Python) and an interest in epigenetics will be beneficial, but additional training will be provided as needed.

Preferred qualifications: Students with experience or coursework in bioinformatics, computational biology, or a related field are encouraged to apply. Familiarity with statistical software (e.g., R, Python) and an interest in epigenetics will be beneficial, but additional training will be provided as needed.

Is this project for more than one student: Yes

Eunyoung Cho
Department: Dermatology
Project Type: Research
Project Title: Pilot trial of supplemental Vitamin A and nicotinamide in solid organ transplant recipients

Project Description:
We are examining the influence of vitamin A and nicotinamide supplementation through a placebo-controlled pilot clinical trial in which participants are administered either the vitamin pills or a placebo for 6 months. All participants in this study are solid organ transplant recipients. At the beginning and end of the study, blood nicotinamide levels will be measured. We expect that supplementation of vitamin A and nicotinamide will increase blood levels of niacin without leading to adverse effects in solid organ transplant recipients.

Required qualifications: Interest in research and interaction with study participants.

Preferred qualifications: Students will work towards recruiting potential participants for the study at Rhode Island Hospital. Additionally, students will be interacting with participants to schedule their follow-up appointments etc. Students may also be involved in conducting statistical analyses patient data. Furthermore, students will access medical records to identify upcoming appointments of both potential participants and current study participants as well as extract clinical data from patient medical charts. Students may also contribute new trial planning.

Is this project for more than one student: Yes

Zhicheng Jiao
Department: Diagnostic Imaging
Project Type: Research
Project Title: RadiologyGPT: A Platform for Evaluating and Visualizing Medical Imaging Large Language Models

Project Description:
Large language models (LLMs) have shown impressive capabilities in summarizing, reasoning, and interpreting complex medical data, including radiology images and reports. However, their reliability, performance, and clinical usefulness remain uncertain. This undergraduate research project aims to build an open-source platform to evaluate the performance of medical imaging LLMs and make the evaluation process accessible to radiologists and clinical researchers through a user-friendly web interface.

You will work alongside a multidisciplinary team of computer scientists, radiologists, and clinical collaborators to:

Design evaluation workflows to assess model performance on radiology tasks, such as report generation, question answering, and decision support.

Implement benchmarking metrics (e.g., accuracy, consistency, explainability) and visualization tools to interpret model responses.

Build a secure, interactive web interface that allows radiologists to test models, review outputs, and provide feedback directly.

Support the integration of real-world clinical cases to evaluate how these models perform in practice.

This is an exciting opportunity to contribute to cutting-edge research at the intersection of AI, medicine, and human-computer interaction. Students will gain hands-on experience in machine learning, full-stack development, and translational medical AI. The project is ideal for students interested in AI for healthcare, medical imaging, or building impactful tools for clinical users.

Required qualifications: • Basic understanding of machine learning or natural language processing • Familiarity with Git/GitHub for version control • Strong problem-solving skills and willingness to collaborate in an interdisciplinary team

Preferred qualifications: • Experience working with large language models (e.g., OpenAI GPT, Hugging Face Transformers)
- Familiarity with medical imaging formats (e.g., DICOM) or prior exposure to biomedical data
- Knowledge of evaluation metrics for NLP or AI models
- Experience with frontend design and UI/UX principles

Is this project for more than one student: No

Baylor Fox-Kemper
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Coastal Ocean Resilience through Observation-informed Modeling

Project Description:
The Coastal Ocean Resilience Research group at Brown University (Fox-Kemper and Di Lorenzo, faculty leads) is working with URI scientists and RISD artists to model the Narragansett Bay to Block Island Sound, Martha's Vineyard, Fishers Island and up into the estuaries of the Providence River. A goal of their research is improving the Ocean State Ocean Model (OSOM) and the Regional Hydrological Integrated Modeling System (RHIMS), which take into account all parts of the bay and regional landform to show the past and present of how the region is changing. Important research tasks are (1) evaluating the behavior of the OSOM/RHIMS versus observations and finding and preparing observations that can be used to initialize forecasts, (2) downscaling climate projections for 2050 and 2100 from large-scale coupled Earth System Models (ESMs), and (3) linking the physical variability of the model to social-ecological impacts in the Bay. The overarching goal is to be able to accurately project changes in climate of the bay and RI over years and decades and forecast weather changes up to 2 weeks. Scientists working with Fox-Kemper, Di Lorenzo, and other group researchers have analyzed variables from buoys, in situ measurements, drones, and satellites including salinity, water level, water density, water pressure, chlorophyll, bacteria growth, algae bloom frequency, spectral reflectance and wave velocities in order to help model the Narragansett Bay and the inner coastal shelf. Many of these projects have led to visualization extensions in collaboration with Brown's CCV and the Nature Lab at RISD.

Required qualifications: Coding experience

Preferred qualifications: Coursework or experience in oceanic & atmospheric sciences, statistics and dynamical systems, physics and engineering, data sciences and machine learning.

Is this project for more than one student: Yes

Christopher Horvat
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Characterizing Ocean Marine Heatwaves in 3D

Project Description:
Marine heatwaves, defined as periods of anomalously high ocean temperatures, are becoming more frequent, intense, and persistent due to ongoing climate change. These events threaten marine biodiversity, disrupt fisheries, and impact global oceanic and atmospheric systems. The project will advance our understanding of marine heatwaves by generating a global dataset that characterizes their spatial extent and evolution over time.

Building on a previously validated algorithm for identifying 3D marine heatwaves in the Arctic in our research group, this project will extend this approach to global scales. The mew global heat wave dataset will enable us to identify persistent hotspot regions, and examine the patterns of marine heatwave events. The analysis will help develop our understanding of how the ocean is affected by climate change, how regional heat anomalies develop, and how they interact with other extreme events. Information about the research group can be found at polar-oceans.com and prospective UTRA students are encouraged to attend weekly meetings of the Antipodal Oceanography Group on Tuesdays at 3PM.

Required qualifications: Ability to read scientific literature, and a familiarity with Python programming.

Preferred qualifications: Experience working with big data in a climate context.

Is this project for more than one student: No

Daniel Ibarra
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Cave Secrets and Desert Clues: Tracing Paleoclimate with U-Series Dating of Carbonate Archives

Project Description:
One way scientists understand the climate processes shaping Earth's surface environments is by reconstructing how these environments have changed through time. This often involves building paleoclimate records, which rely on precise, high-resolution dates from geologic materials. Among the most commonly used are carbonates, such as tufa and speleothems, which precipitate from lake and cave waters respectively. These materials are especially valuable because they record interactions between the water and carbon cycles, offering snapshots of climatic conditions at the time of their formation. The timing of carbonate formation can be determined using uranium-series dating, which relies on the radiogenic ingrowth of 230Th (daughter) from the radioactive decay of 234U (parent). We seek an undergraduate researcher interested in learning isotope geochemistry techniques and applying them to a variety of U-Th geochronology projects, including understanding karst landscapes in the Philippines and quantifying changes in western U.S. hydroclimate. Training will include working in a clean Trace Metal Lab (TML) with techniques such as wet chemistry, ion-exchange chromatography to purify samples, and inductively-coupled plasma mass spectrometry.

Required qualifications: N/A

Preferred qualifications: Introductory Earth science and/or chemistry.

Is this project for more than one student: Yes

Daniel Ibarra
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Stable Isotope Analyses of Meteorites

Project Description:
Stable isotope analyses of meteorites can be used to classify meteorites, infer the formation conditions, and advance our understanding of early solar system evolution. Triple oxygen isotopes in particular (18O/16O and 17O/16O) are a powerful tool for tracing terrestrial and planetary processes and are the primary isotope system used for meteorite classification. Despite significant work on the topic, ambiguity regarding the degree of homogenization between the Earth and the Moon-forming impactor 'Theia', the cause of variations observed in meteorites thought to have originated from Mars, and the variability of isotope compositions within any given meteorite group prior to terrestrial contamination still exists. As such, refining the expected variations and differences in the triple oxygen isotope composition of the Earth, Moon, Mars, and meteorites from differentiated and undifferentiated asteroids has important implications for solar system evolution and is relevant for analyses of future return samples.

This project entails several components that may vary in frequency and amount throughout the semester. By participating in this work, we anticipate that the student will gain experience with dataset analysis, analytical methods in oxygen isotopes, and contribute to a growing body of work utilizing oxygen isotopes to study planetary processes. Each component (below) may be tailored to best accommodate the shared interests of the student, graduate student (Riley Havel), faculty advisor (Daniel Ibarra), and collaborators:
1) Meteorite sample processing: The student will help prepare meteorite samples from around the world. This process includes sample cleaning, polishing, crushing, and leaching.
2) Data processing: The student will help reprocess and compile all existing terrestrial (primarily igneous), lunar and martian triple oxygen isotope datasets from the literature and Meteoritical Bulletin and process data produced from samples analyses in the Ibarra laboratory.
3) Stable isotope measurements: The student will learn to make stable isotope measurements of meteorites, make interpretations from the data, and report data and interpretations to collaborators.

Required qualifications: N/A

Preferred qualifications: Coursework in Earth science or planetary science, and high school or college chemistry.

Is this project for more than one student: No

Eben Hodgin
Department: Earth, Environmental and Planetary Sciences
Project Type: Research

Project Title: **Provenance of Cretaceous-Neogene sandstone units on Block Island**

Project Description:
Detrital minerals can be used to characterize a depositional environment and trace sediments to a source. Two lithologically different pre-Pleistocene deposits on Block Island appear to have distinct sources. One is a red micaceous sandstone and the other is a quartz pebble conglomerate. This study will involve separating and analyzing detrital zircon and apatite from the two rocks, then determining the absolute age and exhumation age of the minerals.

Required qualifications: EEPS220, EEPS230, EEPS 240

Preferred qualifications: EEPS220, EEPS230, EEPS 240. Laboratory skills.

Is this project for more than one student: No

Eben Hodgin
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: **Critical Minerals of Rhode Island**

Project Description:
Incompatible alkali, transition and Rare Earth elements tend to be enriched in late-stage granitic melts that form aplite and pegmatite dikes. The Narragansett Pier and Westerly granites in southern Rhode Island are compositionally fertile being derived from partial melting of sedimentary protoliths. The granites contain numerous cross-cutting aplite and pegmatite dikes representing late-stage hydrous melts from the fertile granitic melt. Incompatible elements, that are classified as Critical Minerals, may be especially enriched in the late-stage dikes of the Narragansett and Westerly granites. In this study, you will sample the host rock and dikes at several localities. Then, you will prepare the rock samples and carry out elemental abundance analysis of incompatible elements such as Li, Cs, Rb, Nb, and Ta.

Required qualifications: Knowledge and interest in geochemistry and petrology by taking courses such as EEPS 0220 or 0230 or equivalent.

Preferred qualifications: Knowledge and interest in geochemistry and petrology by taking courses such as EEPS 0220 or 0230, or more advanced. The ideal student is interested in making the opportunity a project that could be presented at a conference, be turned into a thesis project, and/or published as a paper and would have the geochemical, analytical, and quantitative skills to model processes of major and trace element depletion/enrichment between the host rock and dikes.

Is this project for more than one student: No

Emily Cooperdock
Department: Earth, Environmental and Planetary Sciences

Project Type: Research
Project Title: Understanding faults and fluids in the North Atlantic: Data analysis and modeling approach

Project Description:
The tectonic evolution of the North Atlantic ocean is constrained by a unique set of deep sea drill cores that recovered rock samples from the oceanic bedrock. For decades, Earth scientists have used these core samples to understand the geochemistry, geophysics, mineralogy and timing of North Atlantic rifting. In this UTRA, you will have access to a novel dataset of new geochronologic constraints (i.e., timing constraints). It will be your job to interpret and model the thermal history of these data in the context of available literature on North Atlantic rifting. We will use these results to test prevailing theories on the direction of faulting and timing of fluid-rock interactions in the Cretaceous when the ocean basin developed. You will work with Prof. Emily H. G. Cooperdock, who will train you on data analysis and modeling over the course of the semester. The goal of the UTRA will be to develop models that can be used in a future scientific publication. Note this UTRA will be all computer-based.

Required qualifications: At least one EEPS course, experience with literature review, excellent communication, dependability and ability to work independently on tasks

Preferred qualifications: Familiarity with plate tectonic processes, thermochronology and/or geochronology concepts

Is this project for more than one student: No

Emily Cooperdock
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Communicating Earth Science Concepts through Children's Books

Project Description:
Concepts of Earth Science are fundamental to understanding the health, history, and future of our planet. Yet, there is a dearth of children's books that convey Earth Science concepts. In this UTRA, you will work with Prof. Emily H. G. Cooperdock to develop 1 (or more) concepts for childrens books that convey key Earth Science themes (including, but not limited to, the age of the Earth, plate tectonics, how we study the Earth, global change). The student will meet with Prof. Cooperdock weekly along with other relevant collaborators we identify. Over the course of the semester the student will work with Prof. Cooperdock to develop the concept, conduct research on the concepts, and write and illustrate the book prototype. To learn more about Prof Cooperdock you may visit: https://sites.brown.edu/cooperdock/

Required qualifications: Proficiency in illustration and writing, excellent communication skills, familiarity with children's books

Preferred qualifications: One or more courses in Earth, environmental, or planetary sciences

Is this project for more than one student: No

James Head
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: The NASA Artemis Program Human Exploration of the Moon and Mars: Designing a 500-day Mars-Like Lunar Mission

Project Description:
Artemis Exploration of the Moon (https://www.nasa.gov/specials/artemis/) and on to Mars (https://www.nasa.gov/humans-in-space/humans-to-mars/) is underway! In our research lab at Brown, we studied 13 Artemis candidate landing sites for the first human landing in >50 years. But how can we learn from the lunar Artemis missions about how to explore Mars, which will involve a 500-day long mission duration? To accomplish this, we have undertaken a "500-day Design Reference Mission (DRM)" to the Hadley-Apennine region of the Moon, the exploration site for Apollo 15, the first Scientific Expedition to the Moon. We are asking: What unanswered questions remain from Apollo 15 exploration? How can we gain access to the answers? What type of mobility and infrastructure do we need to address these questions? What type of base and remote habitats are needed and where should they be placed? What innovative types of materials (e.g., Myco-Architecture) can be used for building habitats?
On the basis of my personal involvement and experience (Apollo 11-17) in the Apollo Lunar Exploration Program site selection, astronaut training, mission planning and operations, we undertook a "500-day Design Reference Mission (DRM)" to the Hadley-Apennine region of the Moon, with the involvement of Astronaut David Scott (Brown Visiting Professor), and Brown Undergraduates/Graduate Students, including former UTRA grantees. We are interacting with NASA Astrobiologist (Adjunct Professor) Lynn Rothschild (https://www.nasa.gov/people/lynn-j-rothschild/) on the use of MycoArchitecture (https://www.nasa.gov/general/myco-architecture-off-planet-growing-surface-structures-at-destination/) as an innovative low mass, in situ building material for Moon/Mars.
In this continuing research, we are using our experience with the six Apollo landed missions to examining various remote sensing data sets (images, altimetry, slope, roughness, geology, spectral properties, etc.) to develop a strategy and plan for the "500-day Design Reference Mission (DRM)" to the Hadley-Apennine region, and outlining lessons for Mars. Former participants have received NASA internships and admission to International Space University.

Required qualifications: The SPRINT/UTRA candidate should have some experience in one or more of the fields of science, geology, engineering, computer science, and data processing and analysis; image processing experience is very useful. The selected candidate will work directly with Professor Jim Head and members of his lab in the analysis and synthesis of the DRM.

Preferred qualifications: The Fall 2025 SPRINT/UTRA Fellow(s) will assist in the gathering and analysis of various digital data sets using several sources (e.g., Lunar Orbital Data Explorer; https://ode.rsl.wustl.edu/moon/) and display platforms (e.g., ArcGIS). These products will then be synthesized and analyzed and amalgamated into the DRM, in a mutual learning and exploration environment in my lab at Brown. Progress on the DRM will be presented at professional meetings and key NASA Workshops, and forwarded to NASA for further discussion and communication.

Is this project for more than one student: No

James Head
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: The NASA CLPS Mission to the Enigmatic Ina Structure on the Moon: The DIMPLE Experiment:

Project Description:
The NASA Commercial Lunar Payloads Services (CLPS) Program flies missions and mission scientific payload to landing sites on the Moon of very high scientific interest. NASA has selected the DIMPLE experiment to fly on a CLPS mission to the Moon in 2028, destined for the enigmatic Ina Irregular Mare Patch (IMP) (https://en.wikipedia.org/wiki/Ina_(crater)), that may have formed less than 100 million years ago, or alternatively may be 3.5 billions years old! The DIMPLE experiment will land on Mons Agnes at Ina, and with the help of a small rover, will gather and radiometrically date surface samples in situ to resolve the age conundrum so essential to understanding the thermal evolution of the Moon, thought to have been inactive for about 2 billion years! The DIMPLE Team is led by Scott Anderson, Brown '90, and I am a co-investigator (https://www.brown.edu/news/2023-07-24/dimple). Our job is to assist the DIMPLE team by mapping Ina and surrounding terrains in preparation for landing, rover traverse operations, sample analysis, and data interpretation.
On the basis of my decades of experience of participation in 20 previous space missions, participants in our efforts will learn about space mission scientific goals and objectives, science and engineering synergism, how space mission are planned and executed, and how the results are interpreted. Importantly, they will be immersed in a team effort at Brown with other undergraduates and graduate students in my lab, as well as the team itself, with co-investigators from around the US and in other countries. The will also have the opportunity to write and submit abstracts, and potentially travel to professional meetings. This project offers an excellent opportunity for a student to explore a wide array of space-related career trajectories.

Required qualifications: The SPRINT/UTRA candidate should have some experience in one or more of the fields of science, geology, engineering, computer science, and data processing and analysis; image processing experience is very useful. The selected candidate will work directly with Professor Jim Head and members of his lab in the analysis and synthesis of data in preparations for the CLPS Mission to Ina.

Preferred qualifications: The Fall 2025 SPRINT/UTRA Fellow(s) will assist in the gathering and analysis of various digital data sets using several sources (e.g., Lunar Orbital Data Explorer; https://ode.rsl.wustl.edu/moon/) and display platforms (e.g., ArcGIS). These products will then be synthesized and analyzed and amalgamated into the DIMPLE CLPS Mission Planning, in a mutual learning and exploration environment in my lab at Brown. Progress on the Ina research will be presented at professional meetings and key NASA Workshops, and forwarded to NASA for further discussion and communication.

Is this project for more than one student: No

Seda Salap-Ayca
Department: Earth, Environmental and Planetary Sciences

Project Type: Research
Project Title: Visualizing Spatial Uncertainty: Open-Source Tools and User-Centered Evaluation

Project Description:
Background and Context

This project will develop and evaluate an open-source implementation of the value-by-alpha cartographic technique for visualizing uncertainty in spatial data. Value-by-alpha maps encode data confidence through varying opacity, allowing users to perceive uncertainty alongside spatial patterns. This visualization technique is especially valuable in environmental, socio-economic, and planning contexts, where decisions often rely on incomplete or imprecise data.
The student will create interactive mapping tools in Python that use value-by-alpha to represent uncertainty, build instructional materials as part of a larger open-source initiative, and conduct a small-scale evaluation to investigate how users perceive and interpret opacity-based uncertainty visualization.
Goals and Objectives
The main goals of the project are to:
Design and implement value-by-alpha visualizations using Python libraries such as Matplotlib, GeoPandas, and ipyleaflet or Folium.
Develop modular and educational Jupyter Notebooks that demonstrate the technique with example datasets.
Document findings and make tools publicly available through Mappy Python Diaries, an open-source platform for spatial analysis and visualization.

Student Involvement and Learning Outcomes

The student will be involved in all phases of the project, including:

Researching existing uncertainty visualization methods and tools
Coding and refining interactive map prototypes

Through this work, the student will gain experience in:

Cartographic and geovisualization techniques
Open-source spatial data science in Python
Reproducible research and open-access publishing

Required qualifications: Introductory experience with Python (e.g., through coursework, personal projects, or online tutorials); Familiarity with GIS concepts (e.g., coordinate systems, spatial data types), ideally through Introduction to GIS or equivalent ; Interest in cartography, data visualization, or spatial data communication; Willingness to engage in open-source development and user-centered design

Preferred qualifications: Experience with Jupyter Notebooks, GeoPandas, or Matplotlib
Prior coursework in cartography or data visualization
Interest in uncertainty, environmental data, or decision-making under risk
Completion of Cartography & Geovisualization or a similar course focused on spatial data representation
Experience with Python libraries for mapping and visualization (e.g., GeoPandas, Folium, ipyleaflet, or Matplotlib)
Familiarity with Jupyter Notebooks and version control (Git/GitHub)

Interest in uncertainty visualization, perceptual design, or human-centered mapping
Experience working with real-world spatial datasets (e.g., environmental, socio-economic, or planning data)

Is this project for more than one student: No

Tim Herbert
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: The world before the ice ages

Project Description:
Our lab uses marine sediments to reconstruct earth's past climate changes. The focus of this project would be to examine deep sea sediment records that contain information on past temperature and ecological patterns in the ocean during the last period of earth history before the glaciation of Greenland and the recurrent northern hemisphere ice ages. Work will include micropaleontological and geochemical examination of core materials for these reconstructions

Required qualifications: Attention to detail, comfort with spreadsheets

Preferred qualifications: EEPS 0240, inorganic chemistry

Is this project for more than one student: No

Yongsong Huang
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Novel applications of alkenones in sea ice reconstruction and hot house climate studies

Project Description:
With our recent development of the most sensitive and selective, HPLCMS-based analytical method for long chain alkenones, a class of ubiquitous lipid biomarkers in the ocean, a new suite of paleoclimate applications are opened up. One of such applications is the quantitative reconstruction of past sea ice variations around the Arctic and Antarctica. Our previous research has shown a sea ice dwelling isochrysidales resides in seasonal sea ice and leave a readily traceable alkenone biomarker fingerprint. The research will examine a large sets of samples in the Arctic to further understand the relationship between sea ice and alkenone distributions and also study how sea ice has varied in the past 20 thousand years in critical ocean sites. The second aspect of the research involves testing a hypothesis that C38 ethyl and methyl ketone ratios may be used for paleotemperature reconstruction above the saturation limit (~28 C) for alkenone unsaturation ratios. If successful, this effort will greatly expand the range of applications of the most successful paleothermometer and open up many new research venues for understanding hothouse climates.

Required qualifications: Chemistry and/or geochemistry courses

Preferred qualifications: Courses and/or strong interests in climate change research and paleoclimatology

Is this project for more than one student: Yes

Yongsong Huang
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: A novel approach to comprehensively characterize organic compounds in astromaterials for astrobiological research

Project Description:
The proposed research has the potential to revolutionize organic characterization for astromaterials. Currently, GCMS analyses are widely used for analyses of carbonaceous meteorites and asteroids. Currently, however, only the compounds with a library match are used for interpretation. We estimate that over 80% of the compounds that are already analyzed by GCMS are completely wasted and not used for statistical analysis of different types of astromaterials. The proposed research takes advantage of new software developed in Professor Yongsong Huang's group that allows automatic labeling and storage of the mass spectrum that does not currently exist in the available mass spectral library. When a compound in the GCMS analysis of an astromaterial does not match any mass spectrum in the mass spectral library, the mass spectrum is automatically stored in a new database, and the unknown compound is given a unique identifier. When a compound in a different astromaterial containing the same compound is found, the same identifier will be given to it. The software also allows automated quantification of all compounds in an astromaterial. Although the molecular structure of the newly labeled compound is currently unknown, we can already start to use the compound abundances and its presence or absence in different astromaterials for astrobiological inferences. If, indeed, one particular compound has exceptional importance for differentiating different types of astromaterials (e.g., meteorites), efforts will be made to fully determine the molecular structure of the compound.

Required qualifications: Chemistry, and particular organic chemistry

Preferred qualifications: Strong interest in astrobiology

Is this project for more than one student: No

Laurence Smith
Department: Earth, Environmental and Planetary Sciences; Institute at Brown for Environment and Society
Project Type: Research
Project Title: Machine-learning model development to aid satellite detection of river ice

Project Description:
The research project aims to leverage Google Earth Engine, as well as satellite data from multiple sources (e.g., Sentinel, Planet, SWOT), to help classify and distinguish between ice-covered and open-water conditions on lakes and rivers. The objective is to develop an efficient workflow for analyzing satellite imagery and to build a dataset with ground-truth labels for future cryosphere research. The project will provide valuable information directly for several ongoing research projects within our group. For example, the dataset with ground-truth labels will be used to develop machine learning models for ice detection using NASA's Surface Water and Ocean Topography (SWOT) data.

The student will:
Utilize Google Earth Engine to access and analyze satellite imagery datasets.
Develop and apply algorithms to identify ice coverage on waterbodies.
Validate results through visual inspection and comparison with other existing datasets.
Assist in summarizing and visualizing datasets for presentations and reports.

The student will gain essential knowledge and skills in remote sensing, programming with JavaScript/Python, data visualization, and interpersonal communication. The project will serve our broader research goal of monitoring cryosphere changes and contribute to understanding regional and global climate impacts.

Required qualifications: Basic computer skills and willingness to learn programming. Ability to work independently and collaborate with a research team.

Preferred qualifications: Previous experience in coding languages such as Python.
Previous experience in remote sensing or GIS.
Interest in cryosphere and climate research.

Is this project for more than one student: No

Heeyeong Jung
Department: East Asian Studies
Project Type: Course Development
Project Title: Developing a performance-based, digital textbook for Korean language learners.

Project Description:
Traditional Korean language textbooks are not sufficient to immediately reflect the constantly changing societal values and linguistic shifts that have emerged in modern times. To overcome this challenge, the textbook has been developed in a digital format, offering flexibility and ease when updating and revising materials. Unlike major European languages, digital textbooks or course materials are rarely available in Korean, especially those written for English-speaking learners of Korean. This performance-based digital textbook has been developed based on the Integrated Performance Assessment (IPA), where learners engage in interconnected multi-tasks under one overarching theme, employing authentic, real-life tasks reflecting real-world communication.

Eight modules of the digital textbook have been developed on various themes and topic areas such as contemporary life (i.e., K-food, K-fashion), travel, hobbies, intercultural communication, environment and

sustainability, workplace culture, and DEI, etc. Additionally, relevant and significant topics such as health & wellbeing, science & technology, gender & diversity, identity & diaspora will be included in the topic modules. The digital textbook aims to provide Korean language learners with the necessary skills to communicate effectively across cultures while building digital literacy and community connections.

The student's primary responsibilities will include formatting Word documents, transcribing video clips into Korean, and translating content from Korean to English while maintaining the original meaning and context. Through this project, the student will have the opportunity to gain advanced knowledge of contemporary Korean language, society, and culture. In addition, he or she will learn about key pedagogical practices (i.e., IPA) and the process of developing instructional materials using authentic content. The experience of collaborating with faculty at Brown and other institutions will also help the student build skills in communication and teamwork.

Required qualifications: Advanced Korean language proficiency, proficiency in computer software (i.e., MS Office), strong communication skills, organizational skills, and good work ethics are required.

Preferred qualifications: Successful completion of KREA0600, knowledge of Korean culture, and familiarity with Photoshop are preferred but not required.

Is this project for more than one student: No

Heeyeong Jung
Department: East Asian Studies
Project Type: Research
Project Title: Speech style shifts occurring during cooking club activities among non-native and native speakers of Korean

Project Description:
Speech styles in Korean, which generally correspond to speech registers in English, do not change the propositional meaning of an utterance, but convey its social meaning within a given context. Honorific-rich language like Korean is renowned for complex addressee honorifics reflected on verbal endings, providing the speaker with multiple options when creating an utterance toward addressee. The Korean language offers six different speech styles for the speaker to choose from, depending on the relationship between speaker and addressee. This interesting phenomenon is often observed among native speakers, who shift to a different speech style to obtain their discursive goals and construct or develop desired identities in each moment.

The current study examines the style shifts occurring during cooking club activities among both non-native and native speakers of Korean. Spoken data were collected from participants of a cooking club that I led as part of the co-curricular activities offered during a Korean language summer immersion program. These activities took place weekly for two hours over a span of seven weeks, resulting in approximately 14 hours of recorded material per year. With data collected over two consecutive years, the total amounted to 28 hours.

The study aims to investigate three key questions pertaining to speech style shifts occurring in interactions among non-native and native speakers of Korean during these cooking club activities. First, it

seeks to identify the situations prompting participants to shift their speech styles. Secondly, it examines the involvement of prosody in these speech style shifts, particularly in relation to factors such as ethnicity, gender, and language proficiency. Lastly, the study explores potential variations in participation frames between non-native and native speakers, seeking to uncover any distinctions in their level of engagement within the context of the cooking club environment.

The student involved in this study will transcribe the recordings, translate selected portions of interactions into English, and code the speech styles for the analysis of participants' utterances. Working closely with faculty, he or she will have the opportunity to learn how to analyze spoken data from an indexical perspective, utilizing analysis tools such as CLAN (Computerized Language ANalysis), Praat, and a transcription tool, Daglo.

Required qualifications: Advanced Korean language proficiency, especially near-native in listening skills, proficiency in computer software (i.e., MS Office), strong communication skills, organizational skills, and good work ethics are required.

Preferred qualifications: N/A

Is this project for more than one student: No

Trang Tran
Department: East Asian Studies
Project Type: Course Development
Project Title: Vietnamese Quest II: Expanding the Gamified Journey (Beginner–Intermediate Bridge)

Project Description:
Building on the success of Vietnamese Quest: Gamifying Language Learning (Beginner Level), this second-semester continuation deepens the immersive experience with new modules, expanded storylines, and enhanced interactive systems. The course will transition learners from foundational Vietnamese toward early intermediate proficiency through an engaging, narrative-driven world that promotes collaboration, creativity, and cultural appreciation.
Students will journey further with Nam, the central character, across a gamified Vietnam-inspired world where each region unlocks linguistic and cultural secrets. The second semester introduces new characters, "villains" of language loss, and a branching story with quests tied to more complex sentence structures, deeper vocabulary themes, and real-life communicative tasks.

Key Objectives
- Scaffold learners to achieve intermediate-level communication through narrative and role-play.
- Introduce new personas and plotlines to expand cultural immersion and language applications.
- Create a sustained sense of progression via map-based visuals, interactive journals, and in-world "missions."

Required qualifications: (1) Enthusiasm for creative educational design. (2) Basic to intermediate experience with the Vietnamese language. (3) Strong collaborative, communication, and organizational abilities. (4) Commitment to inclusive and culturally respectful storytelling.

Preferred qualifications: (1) Familiarity with Canvas, Padlet, Quizlet, Kahoot, or gamification-friendly platforms.
(2) Experience in narrative writing, graphic design, or game mechanics.
(3) Skills in video/audio editing or visual storytelling.

Is this project for more than one student: Yes

Hye-Sook Wang
Department: East Asian Studies
Project Type: Research
Project Title: The Koreans

Project Description:
The goal of this project is to translate the book entitled “Story of Koreans” (한국인 이야기) by O-Young Lee. There is no debate that the author Lee is one of the most respected and highly regarded intellectuals in modern Korean society in general and Korean academia in particular. He was a prolific writer who wrote more than 100 books until he passed away in 2022. Not only was he a Korean language and literature professor at Ewha Womans University, but he was a literary critic and novelist. He also served as the minister of Culture, Sports, and Tourism of S. Korea during Tae-Woo Rho administration.

With the enormous popularity of Hallyu or K-culture that received global attention in mid 1990s and continued to be flourishing now, student enrollment in Korea-related courses (language courses as well as non-language courses alike) in U.S. higher education institutes soared reflecting student interest in Korea. As a result, schools offering courses on Korea has increased and more books have been published on Korea as well. Despite such positive changes, books focusing on Korean people written in English are few to none, unlike in Korea where academic/scholarly discussion on who Koreans are has been on the rise in recent years.

“Story of Koreans” that Dr. Lee wrote undoubtedly is a truly inspirational book that will help students deepen their understanding of Korean people who made a well-known ‘miracle of Han River’ possible and gain a valuable insight without a language barrier once it is translated into English. This translated book will be used as one of the required texts for a course that I have been developing when it is offered.

The UTRA fellow will work on translating this book under my direction.

Required qualifications: bilingual proficiency in English and Korean

Preferred qualifications: Some background knowledge about Korea; Korea-related courses

Is this project for more than one student: No

Thomas Roberts

Department: Ecology, Evolution and Organismal Biology
Project Type: Research
Project Title: Eye muscle scaling and comparative morphology in vertebrates

Project Description:
This project aims to understand the evolution of a highly conserved musculoskeletal system. Vertebrates (fishes, reptiles, birds, mammals, etc.) have muscles attached to the outside of their eyes. These muscles, called extraocular muscles (EOMs), direct eye gaze, both steadying the eye during animal movement and directing eye motion when an animal is looking at an object. Interestingly, unlike other skeletal muscles, the basic morphological plan of muscle origin and insertion is maintained across all jawed vertebrates. This project asks two broad questions: 1) How do EOMs scale (mass, cross-sectional area, length, etc.) with both animal and eye size? Scaling relationships between body size and organ size are important to understanding organ function. 2) What ways do EOMs vary between vertebrate groups and adapt for optimal function? Vertebrates have highly varied head morphology and adaptations for vision. Consequently, EOMs must adapt according to these changes (i.e. large eyes in nocturnal animals).

Students involved in this project will work with a graduate student to measure functionally relevant metrics to understand how EOM scaling and shape vary in vertebrates with specific emphasis on biomechanical understanding of EOM function. Day-to-day, students will complete gross dissections of many vertebrates to obtain relevant eye and EOM metrics and how they may impact EOM function. They will also have the option to learn 3D segmentation of contrast-enhanced CT scans to obtain these same measurements in museum specimens. Students will learn how to analyze large morphological datasets with special focus on comparing differences with particularly disparate species. Students will have the opportunity to ask their own questions that direct their own research interests. Through this work, they will gain experience in dissection, phylogenetic comparative analyses, 3D data analysis and visualization, and literature review. Questions can be directed to emily_mcparland@brown.edu.

Required qualifications: · Interested in biology, biomechanics, anatomy, or related fields, Attention to detail and organization. Willingness to engage in gross dissection of fresh frozen specimens

Preferred qualifications: Some coursework in biology, biomechanics, or a related field

Is this project for more than one student: Yes

Eleanor Caves
Department: Ecology, Evolution, and Organismal Biology
Project Type: Research
Project Title: Cleaning Behavior in Cleaner-Client Mutualisms

Project Description:
Most organisms on Earth are involved in a mutualism—a mutually beneficial interaction between species—making mutualisms a profoundly influential, structuring force across levels of biological organization. Mutualisms provide ecosystem services like nitrogen fixation and pollination and contribute to ecosystem stability. Despite their importance, general principles regarding the mechanisms of mutualistic cooperation—the nuts and bolts of how and why mutualistic partners cooperate—have

remained elusive. Understanding how mutualisms function will contribute to our understanding of ecosystem function, and help identify mutualisms, and thus ecosystems, vulnerable to changing environments.
Research in the Caves lab focuses on the Caribbean cleaner shrimp Ancylomenes pedersoni, a small tropical crustacean that engages in a “cleaning mutualism.” A. pedersoni lives in groups of ~2-7 individuals on an anemone host, or “cleaning station”, and eats ectoparasites from dozens of species of reef fish “clients.” Intriguingly, at least half of client visits are by fish species that eat crustaceans, but cleaner shrimp are almost never consumed. Our research asks: Why doesn’t the client eat the cleaner? Or: how, evolutionarily, do parties that would otherwise be predator and prey recognize one another and decide to cooperate?
To answer this question, we record video footage of cleaner-client interactions in nature, and bring that footage back to Brown to watch. Students involved in this project will watch video footage of cleaning stations to note specific cleaner shrimp and client fish behaviors and contribute to a large dataset of interactions between cleaners and clients that we use to answer questions such as: what behaviors allow this interaction to proceed cooperatively? How do individual cleaners and clients differ in their behaviors? How do cleaning interactions vary over space and time?

Required qualifications: N/A

Preferred qualifications: Coursework: Evolutionary Behavioral Ecology, Hormones and Behavior

Is this project for more than one student: Yes

Eleanor Caves
Department: Ecology, Evolution, and Organismal Biology
Project Type: Research
Project Title: Exploring mechanisms underlying mutualistic cooperation

Project Description:
Determining when, and with whom, to cooperate, is a central challenge for many organisms. A primary class of cooperative interaction is “mutualism,” or mutually beneficial interactions that occur between species. However, many open questions remain about the mechanisms by which partners in a mutualism recognize one another, decide to interact, and determine aspects of the interaction like how long it should continue. This is an important knowledge gap to fill because mutualisms underlie ecologically important ecosystem services, and so understanding how and why they occur (and equally under what circumstances they may not occur, or be disrupted) is an important step in our efforts to conserve ecosystems. In brief, studying how and why mutualistic partners choose to engage with one another will allow us not only to increase our understanding of the mechanisms underlying mutualistic interactions, but also how they may be vulnerable to changing environments, since many anthropogenic impacts are altering sensory environments.
Research in the Caves lab focuses on the Caribbean cleaner shrimp Ancylomenes pedersoni, a small tropical crustacean that engages in a “cleaning mutualism.” A. pedersoni lives in groups of ~2-7 individuals on an anemone host, or “cleaning station”, and eats ectoparasites from dozens of species of reef fish “clients.” Intriguingly, at least half of client visits are by fish species that eat crustaceans, but cleaner shrimp are almost never consumed. Our research asks: Why doesn’t the client eat the cleaner? Or: how, evolutionarily, do parties that would otherwise be predator and prey recognize one another and

decide to cooperate?
To answer these questions, we perform behavioral assays on captive cleaner shrimp in the lab, which test the ways that they respond to certain stimuli and determine whether or not to clean. Students involved in this project will carry out behavioral assays on live cleaner shrimp. For example, we sometimes display visual stimuli or different food sources to cleaners, to evaluate what information they are gathering as they determine whether or not to engage in cleaning. They will also assist with annotating video footage from previous behavioral assays, as well as annotate and analyze the data from the assays that they conduct.

Required qualifications: N/A

Preferred qualifications: Coursework: Evolutionary Behavioral Ecology and/or Hormones and Behavior

Is this project for more than one student: Yes

Elizabeth Brainerd
Department: Ecology, Evolution, and Organismal Biology
Project Type: Research
Project Title: High-Speed Video Analysis of Heron Predatory Behavior

Project Description:
The goal of this project is to analyze video data of herons and egrets feeding on fish and other aquatic prey in their natural environments. This project will provide an undergraduate student with experience analyzing high-speed video data and conducting biomechanical analyses. The student will assist in analyzing heron and egret feeding strike kinematics, potentially including the calculation and analysis of joint rotation angles to understand details of their strike movements. Kinematic analysis will involve tracking eye movements in pre-existing video recordings using specialized software to quantify kinematic variables like velocity, acceleration, and strike duration. They will then process these data, conduct statistical analyses to test hypotheses related to strike kinematics and prey capture success, visualize the data through graphs and figures, and contextualize their findings using relevant literature. Through these tasks, the student will develop skills in video analysis, biomechanical data quantification, statistical analysis, data visualization, understanding scientific literature, data interpretation, and scientific communication (via the 2025 Fall UTRA Elevator Pitch and other possibly other opportunities). The student's contributions will advance the project's goal of understanding the biomechanical principles underlying feeding strikes in herons and egrets (Ardeidae) and provide a foundation for addressing our long-term goal of identifying form-function relationships in the ardeid neck.

Required qualifications: nterest in biology, ecology, biomechanics, zoology, or related fields. Willingness to work on a computer and in a lab setting. Ability to work independently. Attention to detail and strong organizational skills.

Preferred qualifications: Some coursework in biology, ecology, biomechanics, zoology or a related field. Experience with data entry or analysis. Basic understanding of statistical concepts.

Is this project for more than one student: No

Patrick Green
Department: Ecology, Evolution, and Organismal Biology
Project Type: Research
Project Title: Using automated tracking approaches to study fighting behavior in mantis shrimp.

Project Description:
Understanding how animals navigate their environments and interactions with each other is a key goal of animal behavior research. Recent advances in our ability to track the individual positions of multiple animals has led to significant insights, especially in how animals navigate more complex environments than can often be created in the laboratory. In the Green Lab, we are applying tracking approaches to the study of animal contests. In particular, we are asking how animals navigate a competitive landscape that includes varying numbers of potential opponents and contested resources. We study this in mantis shrimp, charismatic crustaceans that fight by exchanging bullet-like blows onto each others' armored tailplates. The student for this UTRA project will work with incoming postdoctoral researcher Dr. Jon Aguiñaga to develop and apply approaches in automated individual tracking in mantis shrimp. The project will begin with exploratory experiments and analyses, with the goal of developing a full-scale experiment by the end of the semester. The student will learn techniques in automated tracking, as well as in animal behavior experimentation, with an emphasis on couching these designs in the appropriate literature. The outcomes of this project will help us understand how animals compete in natural populations.

Required qualifications: Introductory Biology

Preferred qualifications: Animal behavior or ecology; computer vision; computer science

Is this project for more than one student: No

Ivan Kwok
Department: Economics
Project Type: Course Development
Project Title: Active Learning in Industrial Organization

Project Description:
This semester-long project invites an undergraduate student to work closely with faculty to enrich the learning experience in ECON 1420: Industrial Organization. The primary goal is to integrate real-world applications and boost student engagement through active learning.

The student will meet regularly with faculty, offer feedback on course design, and research relevant case studies, current events, and news articles that highlight key IO concepts. These materials will support the creation of readings, slides, discussion prompts, and assignments.

The project will contribute to a more applied and engaging curriculum, with materials used in future offerings of the course. The student will gain hands-on experience in course development and pedagogy. There may also be an opportunity to serve as a TA when the updated version of the course is offered in

Spring 2026.

Required qualifications: Completion of ECON 1420

Preferred qualifications: N/A

Is this project for more than one student: No

David Weil
Department: Economics
Project Type: Research
Project Title: Population Catastrophe: Explosion, Implosion, and Replacement

Project Description:
You will be helping me with a book project. The book, aimed at a non-expert audience, is about the history of population growth, centered around the population explosion in developing countries in the second half of the twentieth century as well as population issues (aging, migration, climate change) that the world faces today. The job of the RA will include finding, reading, and summarizing articles and books, and sometimes contributing draft text. Material that the RA will have to deal with includes both academic work and more popular writing. The job will require a great deal of individual initiative in figuring out what material is most relevant, then tracking it down and digesting it.

This job involves frequent face-to-face interaction as well as communication through email, documents, annotations to documents, and so on. The RA will be encouraged to engage deeply with the material in the project -- including critiquing the professor's approach or his presentation of material, suggesting new perspectives, seeking out new material and bringing it into the process, and so on. It is hoped that this will give the RA a behind the scenes look at how research is actually done.

Required qualifications: Although this is a job within the economics department, it will not use many of the skills developed in economics courses. No statistical or econometric work will be expected. Rather, the most important skills will be those emphasized in other social sciences, including the ability to synthesize material, understand perspectives of different fields and intellectual traditions, weigh arguments, and write cogent summaries. By far the most important criterion for evaluating student applicants will be ability to write well. I will be asking the student RA to help edit my manuscript, as well as to digest and synthesize research materials.

Preferred qualifications: The ideal candidate will have at least some exposure to economics classes, but will not necessarily be an economics concentrator. An extensive course background in some combination of history, sociology, anthropology, philosophy, and similar fields will be very helpful. Journalism or other writing experience would also be helpful. Sometimes I will ask the RA to read a book and summarize it for me, so being happy to sit in the library and do that is an important skill.

Is this project for more than one student: No

Emily Qazilbash
Department: Education
Project Type: Course Development
Project Title: Data and Evidence in Education: course development assistant

Project Description:
As part of a recent redesign of the education concentration, concentrators are required to take "Data and Evidence in Education," a course that provides students with exposure to the big questions we ask in education and the types of data we might collect and analyze to answer different types of questions. I have taught this course several times, and am still refining the way that I scaffold student thinking to help shape their mindsets and skillsets about creating and answering critical questions about the field of education. A student working with me will serve as a thought partner throughout the course to consdier how we teach students about formulating good research questions and also how we teach students about the benefits, drawbacks and uses of quantitative and qualitative data.

This project is ideal for a student who took the course in either spring of 2024 or fall of 2024 and has experience or likes to think about creating learning opportunities for undergraduate students. As part of this project, the student will (1) investigate frameworks used by education researchers in order to choose one to use to teach the course content, (2) examine syllabi of similar courses at other universities, (3) review and select research papers that students will be using in the course to apply their learning, and (4) ensure that class lessons and activities are engaging and tied to the framework chosen.

This project will enable an undergraduate student to be part of the process of strengthening the curriculum and pedagogy of a course required for education concentrators at Brown and to apply knowledge from the literature on thinking critically about quantitative and qualitative research. Ideally the student would attend the course on T/Th 10:30-11:50 in Fall 2025 if interested.

Required qualifications: Has taken EDUC 0750

Preferred qualifications: N/A

Is this project for more than one student: No

Emily Qazilbash
Department: Education
Project Type: Research
Project Title: Labor-management collaboration in K-12 public education systems: literature review and study design

Project Description:
As part of a research project, I am seeking a student who is interested in learning more about how public school districts and teachers unions work together to bring about stronger student outcomes.

This project seeks a student who will research and write a literature review about teachers unions and labor-management collaboration in K-12 public school systems alongside a masters student also working

on this project. These students will join a small team working on a project to design a qualitative interview study about districts that are working in collaboration with their labor partners to improve student outcomes, specifically through partnerships that involve leaders from the district's Office of Human Resources, the district's Office of Academics, and the teachers union.

We will meet weekly or bi-weekly to discuss the themes of the literature review, what students are learning and how ideas and themes connect. In between meetings the students will be (1) identifying, reading, and analyzing research studies, (2) creating an annotated bibliography, and (3) working to write the literature review.

The literature review will likely include research from three areas: K-12 central office and school organizational design, labor-management collaboration, and recent analyses of collective bargaining agreements (CBAs) that support "strategic staffing" as a more expansive alternative to the traditional "one teacher, one classroom" model.

The literature review will inform the design of a qualitative interview study. If the student who is writing the literature review is interested, they can be involved in the design of the study as well as the creation of the interview protocols.

This is a great opportunity if you are interested in education policy, labor issues, organizational change, or if you want to work on a research project with potential for impact on students in public school systems.

Required qualifications: Student must have strong academic writing skills.

Preferred qualifications: Prefer students who have some knowledge about education policy.

Is this project for more than one student: No

Indira Gil
Department: Education
Project Type: Research
Project Title: Examining secondary math preservice teachers' selecting and sequencing strategies

Project Description:
Project Description: I have designed a research study which aims to explore the ways in which math preservice teachers (psts) take into account social considerations when selecting and sequencing mathematical strategies. The following research questions will be considered:
How do secondary math psts make selecting and sequencing decisions about what math strategies are presented and who presents them in math classrooms?
How do secondary math psts selecting and sequencing decisions change over time?
I will be collecting qualitative data during the summer semester and plan to analyze this data in the fall of 2025. A student working with me would research related math education theories and practices to assist with the literature review and will assist with the qualitative coding process. The student will develop an understanding of how to collaboratively analyze qualitative data and how to draw implications for practice.

Required qualifications: At least two education courses

Preferred qualifications: This project is ideal for students who are interested in qualitative research in the social sciences. It is preferred that the student (1) has taken EDUC0560 and/or is familiar with teacher education research, (2) is interested in using qualitative methods in future work or courses

Is this project for more than one student: No

Matthew Kraft
Department: Education
Project Type: Research
Project Title: How can schools become more resilient to climate change and contribute to solutions?

Project Description:
The emerging risks posed by climate change are not thoroughly understood by education policymakers or widely reflected in education policy or practice. As one of the first projects of my new Sustainable Education Research Initiative housed at the Annenberg Institute, I am examining the risks posed to schools by climate change. Schools are increasingly becoming susceptible to damage caused by flooding, wildfire activity, irregular weather patterns, and natural hazards. In addition to physical damage caused to school infrastructure, erratic weather behavior results in school closures and a loss of instructional time for students in the classroom. This project will result in an academic paper summarizing such risks and outlining the schools and student demographics that are most vulnerable to the effects of climate change. This project will use data from a number of sources, including the National Center for Education Statistics, the Federal Emergency Management Agency, the Environmental Protection Agency, and First Street Foundation. I also hope to provide predictions of forecasted risk to schools to highlight the urgent need to address these issues. My aim is for this information to be used by policymakers to prepare public schools for, and adapt to, climate change so they can ensure productive learning environments for all students.

Required qualifications: n/a

Preferred qualifications: Knowledge of earth systems, environmental sciences and/or education policy are a plus.

Is this project for more than one student: Yes

Yoko Yamamoto
Department: Education
Project Type: Research
Project Title: Early Gendered Views on Learning: Narratives of First-Grade Children in Japan

Project Description:
Gender gaps in educational opportunities and academic outcomes have been a persistent issue in Japan.

Previous studies have identified gendered educational tracks, unequal access to educational opportunities, and gender-based family socialization processes to explain such gender gaps in Japan. However, little attention has been paid to how young children develop gender-related beliefs and how such beliefs influence their perceptions of learning processes and academic competence depending on gender. This research project examines the development of learning- and gender-related beliefs among first-grade children in Japan compared to children in the U.S. The project focuses on analyzing the story-completion interview narratives and responses of approximately 110 first-grade children in Japan and 70 children in the U.S. (serving as a comparative case). Depending on language proficiency and experience with statistical data analysis, the UTRA fellow will engage in Japanese data, U.S. data, or both. The fellow will mainly conduct qualitative analysis but will also contribute to quantitative data processing and analyses, depending on experience and skills. In the qualitative component, the fellow will analyze and code interview narratives of children responding to a story about a “smart” student. On the quantitative side, the fellow will assist with tasks such as coding, data entry, cleaning, conducting analyses, and producing visual data presentations. The fellow will also review recent reports and literature on gender and education in Japan and the U.S. Through this work, the student will gain hands-on research experience and develop a deeper understanding of how young children develop gender-related beliefs in their cultural contexts and how such beliefs influence gendered beliefs about learning and education.

Required qualifications: N/A

Preferred qualifications: Native-level proficiency in Japanese; completion of a research methods or statistics course

Is this project for more than one student: No

Yoko Yamamoto
Department: Education
Project Type: Research
Project Title: Cultural Perspectives of Teachers: Analyses of Parent-Child Conversations in Chinese Immigrant and Nonimmigrant Families

Project Description:
The roles of teachers and the characteristics and skills defining “good” teachers have long been central themes in educational research and policy discourse. However, little empirical attention has been paid to families’ perspectives on teachers’ roles and the qualities they value. This gap is especially notable in understanding diverse beliefs and expectations reflecting immigrant and sociocultural contexts. When engaging in conversations about schooling and learning with their children, parents often use their perceptions of teachers, shaped by sociocultural models, to enhance their children’s development of learning-related beliefs. Understanding diverse perceptions of teachers and their roles and how immigrant parents reflect these perceptions in socializing their children is critical for understanding culturally responsive educational practices and fostering positive home-school relations. This ongoing project analyzes perceptions of teachers among Chinese immigrant families (about 200 families) and non-immigrant families (about 100 families) in the U.S. The UTRA fellow will engage in both qualitative and quantitative data processing and analyses. The balance between quantitative and qualitative analyses depends on the fellow's skills and experience. In qualitative research, the fellow will analyze

emerging and recurring themes related to teachers in parents' conversations about learning with their children. For quantitative research, the fellow will engage in data entry, validation, coding, and creating visual presentations. The fellow will gain valuable research experience through these engagements. Involvement in this research will also deepen the student's understanding of the sociocultural impact on parental perceptions of teachers and the development of children's learning-related beliefs.

Required qualifications: N/A

Preferred qualifications: Completion of coursework in quantitative data analysis/social science statistics, or fluency in Chinese

Is this project for more than one student: No

Austin Jackson
Department: English
Project Type: Course Development
Project Title: Fugitive Letters: The Prison Notebooks

Project Description:
This UTRA project seeks to expand an existing nonfictiopn writing course to include a community engagement component that engages current and formerly incarcerated prison writers. ENGL 1191B: Fugitive Letters: The Prison Notebooks, an intermediate nonfiction writing and research course, invites students to consider U.S. carceral spaces as sites of prolific writing and intellectual production. Five (5) widely-published prison writers have accepted my invitation to participate in the course through the exchange of letters with students in the course. I seek an UTRA candidate interested helping incorporate this civic engagement component into the class.

Required qualifications: No prior coursework or experience is required.

Preferred qualifications: Strong writing, organizational skills, and creativity is a plus. This UTRA position is especially suited for students passionate about carceral studies, nonfiction writing, public policy, critical race studies, and/or critical approaches to writing pedagogy.

Is this project for more than one student: No

Nell Lake
Department: English - Nonfiction Writing Program
Project Type: Research
Project Title: RA for the Nonfiction Writing Program's Careers Project (Journalism)

Project Description:
This RA will collaborate with the Academic Writing and Creative Nonfiction RA for the Nonfiction Writing Program's Careers Project (see separate listing).

Many students want to work in journalism after they matriculate, but gaining access to the industry can seem arcane and daunting. The Nonfiction Writing Program wants to make it easier for our students to get training as interns and to find careers. Our journalism-careers RA will help us build the journalism components of a nonfiction-careers database. The RA will also help to create a Canvas or Google site for students so that opportunities, processes, and successes are visible and useful.

Tasks:
1. Research existing and revolving internships, job boards, fellowships, and other resources and opportunities;
2. Contact those asking for interns/employees and seek clarification when necessary;
3. Locate and confirm best practices for journalism internship and job applications, including how to submit applications; how to query, pitch, and write cover letters; and how to use search engines for journalism opportunities;
4. Organize the collected data for compiling into a Canvas page or Google site;
5. Begin to develop a publicity plan to make students aware of this resource.

Required qualifications: Experience in journalism, on campus or elsewhere; some knowledge of the journalism industry; internet research skills; facility with Sheets/Excel and Docs/MS Word; ability to organize electronic data; curiosity about journalism careers.

Preferred qualifications: Coursework in journalism; strong communication skills, for networking with outlets; self-initiative and organizational skills

Is this project for more than one student: No

Emily Hipchen
Department: English, Nonfiction Writing Program
Project Type: Research
Project Title: RA for the Nonfiction Writing Program's Careers Project (Creative Nonfiction + Academic Writing)

Project Description:
Many students want to write, edit, or publish nonfiction after they matriculate, but the industry is not transparent and access is spotty, requires arcane or byzantine processes, and is hard to understand. We want to make it easier for our students to get training as interns and to find careers while and after they've completed their education at Brown. The first piece of our work is to build a knowledge database and begin creating an access point for students so that opportunities, processes, and successes are visible and useful.

Tasks:
1. Research existing and revolving internships, job boards, fellowships, and other resources and opportunities;
2. Contact those asking for interns/employees and seek clarification when necessary;
3. Locate and confirm best practices for internship and job applications, including submissions protocols for nonfiction writing and academic writing (research-based writing in the humanities); query,

pitch, and cover letters in nonfiction and academic writing; and best-use search engines for the various subfields;
4. Organize the collected data for compiling into a Canvas page or Google site;
5. Begin to develop a marketing plan to make students aware of this resource.

Required qualifications: 1. Ability to research jobs and internships on the internet; 2. facility with Sheets/Excel and Docs/MS Word; 3. ability to organize electronic data; 4. curiosity about nonfiction writing careers

Preferred qualifications: 1. Networking skills (email, possibly the phone)
2. Familiarity with how students gather information about careers, for marketing purposes
3. Ability to read job and internship ads (and know what matters)

Is this project for more than one student: No

Rebecca Howe
Department: Family Medicine
Project Type: Research
Project Title: Characteristics and healthcare utilization of palliative care and home-based primary care cohorts

Project Description:
Palliative care is specialized medical care for people living with a serious illness, focusing on quality of life, providing high level symptom management, assisting with complex decision making, and supporting patients at end of life. Home-based primary care (HBPC) provides interdisciplinary, comprehensive care in the home to patients with highly complex medical, psychological, and social needs. These high-need populations sometimes overlap but are often distinct. Both services are offered at VA Providence. Palliative care is associated with reduced readmission rates, hospital length-of-stay, and mortality. HBPC is associated with decreased costs, hospitalizations, and improved access and satisfaction with care. Both palliative care and HBPC often struggle with having a patient demand greater than the supply of providers or program services. The objectives of this study are to 1. characterize the VA Providence Palliative Care and HBPC populations and 2. determine healthcare utilization by cohort population. The student will assist with data collection through chart review and extraction of data from reports. Training in health systems research will be provided. Research output will likely include an abstract for poster presentation and possibly a manuscript. The student will need to undergo onboarding with VA Providence including completion of requisite training and documentation in order to access patient chart information and assist with the research project.

Required qualifications: Good organizational skills, detail-oriented, interest in medicine and/or healthcare utilization

Preferred qualifications: Experience with quantitative data collection and analysis

Is this project for more than one student: No

Joseph "Greg" Rosen
Department: General Internal Medicine
Project Type: Research
Project Title: Eddembe ("Freedom"): Strategies to Support Post-Incarceration HIV Care Linkage, Re-Engagement, and Continuity among Re-Entrants in Uganda

Project Description:
Uganda, a country in East Africa with a generalized HIV epidemic, has among the highest rates of incarceration globally. Incarcerated persons and others in enclosed settings are recognized as a key population in the HIV response, given the elevated risks these populations encounter with respect to HIV acquisition during periods of incarceration. Nevertheless, there is limited understanding of post-incarceration clinical trajectories among persons living with HIV in Africa, and there is a dearth of scholarship identifying feasible, appropriate, and effective strategies to (re-)link formerly incarcerated persons to HIV care at the time of community re-entry in Africa.

Accordingly, the Eddembe study ("Freedom" in Luganda) will explore post-incarceration socio-structural and clinical trajectories among persons living with HIV and identify adjunctive interventions to enhance HIV care continuity among re-entrants in rural Uganda. The student(s) will support the following activities in support of the Eddembe study: (1) develop a qualitative formative research protocol (i.e., study plans, recruitment materials, informed consent forms) for review by ethics review boards in the United States and Uganda; (2) contribute to qualitative semi-structured interview and focus group discussion guides with formerly incarcerated persons living with HIV, corrections officers, and HIV clinicians in Uganda; and (3) conduct a systematic review of adjunctive interventions enhancing HIV care outcomes among persons living with HIV exiting carceral settings in high-burden settings.

Required qualifications: 1. Interest in global health, infectious diseases, and/or HIV treatment; 2. Experience developing qualitative or quantitative protocols; 3. Experience conducting literature reviews and abstracting information from peer-reviewed scientific publications

Preferred qualifications: 1. Exposure to and/or familiarity with qualitative research methods; 2. Service delivery and/or research experience with justice-involved populations

Is this project for more than one student: No

Elyse Couch
Department: Health Services, Policy and Practice
Project Type: Research
Project Title: Experiences of novel diagnostic technologies and therapies for Alzheimer's disease

Project Description:
In recent years, several new diagnostic technologies for Alzheimer’s disease (AD) have emerged. These new technologies can help identify people at greatest risk of developing before the onset of symptoms, enable an earlier and more accurate diagnosis, and identify people eligible for treatment with anti-amyloid monoclonal antibodies (the first new class of pharmacologic treatments in three decades). However,

patient experiences of these new diagnostic technologies and treatments have yet to be explored. This student will contribute to ongoing qualitative studies exploring how people without symptoms of cognitive impairment would like information on dementia risk to be communicated to them and how patients and caregivers decide to pursue the new anti-amyloid therapies. These projects involve collaboration with researchers at King's College London (risk disclosure) and the Butler Hospital Memory and Aging program in Rhode Island (anti-amyloid therapies).

The student(s) will assist with preparing the data for qualitative analysis and assisting with conducting the analysis. Tasks will include transcribing recorded interviews, working with the PI to develop a qualitative codebook, applying qualitative codes to the data, and creating tables. Training in qualitative data analysis will be provided.

Required qualifications: Good organizational skills, strong writing skills, attention to detail, experience with Microsoft Word and Excel, interest in Alzheimer's disease or other dementias.

Preferred qualifications: Experience with conducting qualitative analysis.

Is this project for more than one student: Yes

Emily Gadbois
Department: Health Services, Policy, and Practice
Project Type: Research
Project Title: Understanding Institutional Special Needs Plans

Project Description:
This project is funded by the National Institute on Aging and explores how the Institutional Special Needs Plan (I-SNP) model affects the quality of long-term care for nursing homes and other long-term care residents. I-SNPs are a type of Medicare Advantage plan that aims to improve care by offering tailored healthcare coverage and coordinated care to meet residents' unique needs.
As part of this mixed-methods study, we are conducting qualitative interviews with I-SNP leaders and nursing home administrators around topics of how I-SNPs have impacted care quality for nursing home residents with Alzheimer's disease and related dementias (ADRD) before, during, and after the COVID-19 pandemic. We will be recruiting and interviewing in Fall 2025 and will continue into 2026.

For students interested in healthcare policy, aging services, or public health, working on this project offers an opportunity to understand models of care that aim to improve health outcomes for vulnerable populations. This experience can provide valuable insights into the intersection of healthcare delivery, policy, and patient-centered care. Additionally, skills learned on this project will help students develop skills that would be useful when pursuing a career in academic research, market research, user experience (UX) research, health care, or other social science careers.

The student may be asked to help with recruitment, de-identifying and reviewing transcripts for accuracy, and other work needed for the project. The student will develop skills that will form a foundation for future work using qualitative research. The data gleaned from these interviews will contribute to understanding the factors impacting I-SNP enrollment and growth, and characterize how I-SNP care practices influence resident outcomes, and may contribute to shaping future policy changes around I-SNPs.

Examples of tasks a student will work on:
The student will be expected to contribute to the qualitative arm of this project, including:
Recruitment:
Identifying and contacting I-SNP leaders and nursing home administrators within our eight selected health care markets across the United States for participation in a research interview regarding their experiences with I-SNPs
Interviewing:
Observing research interviews alongside qualitative experts. If interested, and after receiving appropriate training, conducting research interviews alongside qualitative experts
Data Management:
Learning how to manage and organize a qualitative data set
Transcription:
Reviewing transcripts for accuracy and de-identifying protected health information (PHI)
Report Writing:
Conducting literature reviews to identify existing I-SNP related research, identify the gaps in existing research, and make recommendations about how our findings could best fill these gaps. Potential to remain engaged with study and be involved in manuscript preparation and the opportunity to be an author on a peer-reviewed publication

Required qualifications: Interest in learning more about qualitative research, strong communication skills, ability to work independently and as part of a team

Preferred qualifications: Any experience with qualitative research, experience conducting literature reviews and searches using databases, websites, and social media platforms

Is this project for more than one student: No

Emmanuelle Belanger
Department: Health Services, Policy, and Practice
Project Type: Research
Project Title: Understanding Symptom Patterns Across Disease Groups in Palliative Care Consultations

Project Description:
Palliative care is a medical approach focused on improving the quality of life for people with serious, life-threatening illnesses and their families. It addresses physical, emotional, and spiritual suffering. Unlike the Medicare Hospice Benefit—which is a payment program for patients with a prognosis of six months or less who forgo life-prolonging treatments—palliative care can be provided alongside curative therapies. For this project, we will analyze symptom data from over 7,000 patients who received palliative care consultations through a large hospice provider in New England. The organization has collected this data for quality improvement purposes. The study will examine symptom burden over time using the Edmonton Symptom Assessment Scale (ESAS), with analyses stratified by major disease categories.
The student involved in this project will help with quantitative data analysis (e.g., populating and interpreting tables), conduct a literature review, and contribute to a peer-reviewed manuscript. They will gain experience in presenting research findings clearly, including descriptive statistics and regression

results. This project is part of a broader research initiative focused on understanding palliative care delivery in the U.S.

Required qualifications: Interest in or familiarity with palliative or end-of-life care; Ability to conduct literature reviews and summarize findings; Introductory knowledge of statistics

Preferred qualifications: N/A

Is this project for more than one student: No

Emmanuelle Belanger
Department: Health Services, Policy, and Practice
Project Type: Research
Project Title: Organizational Characteristics and Care Process Associated with Quality of End-of-Life Care in Assisted Living Communities

Project Description:
Assisted living (AL) communities are home to a large population of older adults. Our research shows that 35% of AL residents die within three years, highlighting the importance of high-quality end-of-life care in these settings. However, little is known about which care practices contribute to better end-of-life experiences in AL. This project will analyze data from a nationally representative survey of over 2,000 AL administrators across 48 states, collected between 2021 and 2023. We aim to identify organizational factors and care practices that are associated with administrators rating the quality of dying in their communities as “excellent.” Survey data includes variables on organizational characteristics (e.g., facility size, for-profit status, proximity to other care settings, Medicaid acceptance) and end-of-life care processes (e.g., policies on admitting and retaining terminally ill residents, staffing levels, and hospice collaboration).
The student involved in this project will help with quantitative data analysis (e.g., populating and interpreting tables), conduct a literature review, and contribute to a peer-reviewed manuscript. They will gain experience in presenting research findings clearly, including descriptive statistics and regression results. This project is part of a larger research initiative examining what drives high-quality end-of-life care in assisted living communities.

Required qualifications: Interest in or familiarity with palliative or end-of-life care; Ability to conduct literature reviews and summarize findings; Introductory knowledge of statistics

Preferred qualifications: N/A

Is this project for more than one student: No

Iris Montero
Department: Hispanic Studies
Project Type: Research

Project Title: Searching for the First Indigenous Naturalists

Project Description:
Fifteen years after the fall of Mexico-Tenochtitlan, a college for Indigenous youth was established in today's Mexico City. It had various initial aims, amongst them to train students for the clergy and colonial administration. Both goals required the basic tools of the trivium of Renaissance humanist learning (grammar, rhetoric and logic) and, to some extent, of the quadrivium (arithmetic, geometry, astronomy and music). But medicine and natural history, not originally part of the curriculum, gained importance in the activities of Indigenous students, budding scholars at this point, as epidemics ravaged the city and interest in the value and potential utility of New World nature increasingly grew. Pliny's Historia naturalis (c. 79 CE), an encyclopedic compendium of the world during the Roman Empire, was amongst the sources studied at the college. Pliny was particularly useful to the multicultural team composing the Florentine Codex, the richest compendium of natural knowledge produced in sixteenth-century Mexico, providing a model to organize information. But Pliny also inspired certain tropes, turns of phrase, and even full anecdotes that informed how and where Indigenous intellectuals would include their own notions about nature in the Codex. This UTRA project will analyze both natural histories side by side to explore and reconstruct the practice of these first Indigenous naturalists.

Professor Montero would like students to contribute in: 1) assessing the extent of Pliny's influence on Indigenous Mexican naturalists by identifying plant, animal or mineral entries in the Florentine Codex inspired by Historia naturalis; 2) exploring Indigenous naturalists' creative use of Pliny's entries by identifying instances where they codified their own ideas about Mexican nature using Plinian tropes; and 3) developing and feeding a database of both types of indexing between the old and new world natural histories.

Required qualifications: Required skills: prior coursework in Classics, prior coursework in Medieval or Renaissance History or Literature, prior coursework in Colonial Latin American History or Literature, prior coursework in Science and Technology Studies, prior coursework in Indigenous Studies, prior coursework in Art History

Preferred qualifications: Preferred skills: reading knowledge of Renaissance Latin, reading knowledge of classical Nahuatl, fluency in Spanish, prior experience with graduate-level training or coursework, prior engagement with natural history and medicine, previous coursework with Professor Montero

Is this project for more than one student: Yes

Brian Lander
Department: History
Project Type: Research
Project Title: Climate and Society in Ancient China

Project Description:
There is a lively debate among Roman historians about whether a beneficial climate contributed to the success of the Roman empire, but we still know very little on the climate history of China's Han empire, which is comparable in historical significance to the Roman empire. Scientists have produced abundant data on China's paleoclimate, but historians generally do not know how to use it. This project seeks to

employ a student with some background in the earth sciences to work on the climate history of ancient China. Students will spend much of their time reviewing scientific scholarship on China's paleoclimate, working together with historian Brian Lander and geoscientist Daniel Ibarra to produce a synthesis of the period's climate and how it related to human society at this time. Since the goal of this is educational, we do not require the student to have taken advanced classes in paleoclimate or climate history, but students who have taken courses on the topic could do more advanced analysis. The student will learn about the relationship between societies and climates over time, various types of proxies (ice cores, stalactites, pollen, etc.) scientists use to study ancient climates, and how such different types of evidence can be combined. This is part of an ongoing research project that began with Lander and Ibarra co-teaching a climate history courses, and has moved on to research. We will meet every two weeks in the fall semester to discuss the project, moving the research project and the student's learning forward.

Required qualifications: N/A

Preferred qualifications: The student will preferably have taken one or more courses in Earth, Environmental and Planetary Sciences.

Is this project for more than one student: No

Holly Case
Department: History
Project Type: Research
Project Title: Trajectories of Historical Method, Chronology, and Conceptions of Historical Time Across the 20-21C

Project Description:
The project is for a section of a book manuscript relating to historical method and historiography. I'm looking for a student researcher to assist in examining historiographical trends across the 20th and into the 21st century relating to historical method and conceptions of historical time. This would entail going through historical journals, reading articles, book reviews, and historiographical essays, and identifying any changes, especially in terms of chronological shifts and attitudes towards chronology and historical continuity more generally. The research wonders if there are identifiable trajectories (across or within sub-fields) with respect to chronology and conceptions of historical time and, if so, what they might be and what could account for them. Of particular interest is how such trends dovetail or diverge from developments in the other disciplines, how they relate to the nature of research (and especially the use of digital technologies for research), and what the implications of such transformations have been/could be for historians, historical pedagogy, and the broader public's understanding of history.

Required qualifications: Thoroughness, detail-orientedness, and at least 3 courses in History.

Preferred qualifications: Reading proficiency in at least one language besides English would be great.

Is this project for more than one student: No

Jennifer Lambe
Department: History
Project Type: Course Development
Project Title: Popular Culture in the Americas

Project Description:
This course development UTRA will be focused on assisting with the preliminary research for a new History lecture course on the history of popular culture in the Americas. Beginning with the early colonial period and extending through the twenty-first century, the course will cover the emergence of popular and mass cultures across the hemisphere, stretching from Canada to Chile, as well as the transnational connections that have informed their development. From music to dance, sport, food, and fashion, the class will explore the relationship between culture, industry, power, and politics in addition to the ways in which popular culture has shaped and been shaped by individual and group identities.

Required qualifications: Previous coursework in History or related disciplines

Preferred qualifications: Facility and experience with bibliographical searches and historical research, strong organizational skills

Is this project for more than one student: No

Jeremy Mumford
Department: History
Project Type: Course Development
Project Title: Exploring the Role of AI in Teaching Research and Writing

Project Description:
As part of an ongoing project to integrate AI into Humanities teaching, I am exploring how to use current LLM models to aid in acquiring historical research skills, rather than substituting for human effort and learning. I want to experiment with process-oriented assignments in an upper-level seminar and an introductory lecture course which I will be teaching at the same time.

Required qualifications: N/A

Preferred qualifications: History coursework and research papers

Is this project for more than one student: No

Alexie Rudman
Department: Institute at Brown for Environment and Society
Project Type: Research
Project Title: Communicating interdisciplinary coastal climate to support informed

decision-making: Community-driven Coastal Climate Research and Solutions (3CRS)

Project Description:
Low-lying, waterfront communities throughout New England are disproportionately vulnerable to climate hazards, which threaten livelihoods, ocean-reliant economies, critical infrastructure, community health and wellbeing, people's sense of place, and their heritage. By collaborating with four pilot communities in Rhode Island and Maine (2023 - 2028), the Community-Driven Coastal Climate Research & Solutions (3CRS) Hub aims to co-develop resources, tools, and local relationships and knowledge needed to expand the capacity of waterfront communities to become more climate resilient. Information about the 3CRS Hub and our team can be found at 3crs.org.

To increase community access to tools, knowledge, and data they can use to inform coastal climate decision-making, a major component of the 3CRS Project is the development of a Community Knowledge Collective (CKC). The CKC will be a virtual information hub, educational resource hub, and network of organizations and partners dedicated to supporting waterfront communities achieve their visions of a resilient future.

We seek an undergraduate student to support the development of the CKC, by translating and developing science and coastal climate communication products to reach audiences with a stake in coastal resilience. The student will:

-Develop different science communication products- such as short videos, two-pagers, short podcasts, documentaries, graphics and visuals, lesson plans, primers on how to use decision-making tools, art projects- to make information accessible to different coastal stakeholders.
-Help identify barriers to accessing information through content analysis, qualitative research, and meetings with community liaisons;
-Work with different researchers on the team to help communicate the utility of research products and processes on topics like health, social science, workforce development, coastal hazards mapping, and flood monitoring;
-Maintain an online repository of existing information and resources on resilience, and inform the development of the CKC's virtual interface;
-Support the implementation of community workshops depending on the Project's timeline.

Required qualifications: At least beginner experience creating audio or visual communication materials (some examples listed in the description), an initial understanding of coastal climate hazards

Preferred qualifications: An interest in science communication and an understanding of how community-based research differs from traditional academic research methods

Is this project for more than one student: No

Nick Ziegler
Department: International and Public Affairs
Project Type: Research
Project Title: Technology-Oriented Industrial Policies in Europe

Project Description:
Over the last several years, European political leaders have expressed growing concern about the Continent's ability to compete in the digital economy. This project will focus on national as well as European-level policies to promote key industries, especially in knowledge-intensive sectors. This project will trace the evolution of such programs at the national level and the EU-level over the last six years. It will then assess whether these policies are strengthening Europe's ability to compete in world markets for two particular sectors – chips and artificial intelligence. Specific tasks include creating a timeline of the relevant policies and then researching the political debates that surrounded the goals and the allocation of resources that these policies enabled. Ideally, the research will be conducted by a two-person team – one person to focus on Europe and a second person to specialize in comparisons to the United States and China. The work consists primarily of qualitative research in government reports, technical trade journals, company releases, and press sources. Fluency in German and some familiarity with the electronics industries and/or with intelligence are desirable, but not required.

Required qualifications: N/A

Preferred qualifications: German or other European languages; some familiarity with the electronics industries

Is this project for more than one student: Yes

Nick Ziegler
Department: International and Public Affairs
Project Type: Research
Project Title: U.S.-China Competition in the Semiconductor Sector

Project Description:
Since the Chips and Science Act passed during the Biden Administration, the U.S. government has engaged in concerted efforts to deepen domestic fabrication as well as supply-chain redundancy. These policies are being revised by the Trump Administration, but there is little chance that the goals of leading-edge competitiveness will be dropped. This project will trace the evolution of such policies in both the United States and in China. Specific tasks include creating a timeline of the relevant policies and then researching the political debates that surrounded the goals and the allocation of resources that these policies enabled. Ideally, the research will be conducted by a two-person team – one person to focus on United States and China and a second person to specialize in comparisons with Europe. The work consists primarily of qualitative research in government reports, technical trade journals, company releases, and press sources. Fluency in German and some familiarity with the electronics industries and/or with intelligence are desirable, but not required.

Required qualifications: Chinese language helpful and some familiarity with the electronics industries are helpful, but not mandatory.

Preferred qualifications: Some familiarity with the electronics industries and with federal policymaking in the United States are helpful.

Is this project for more than one student: Yes

Cristina Abbona Sneider
Department: Italian Studies
Project Type: Course Development
Project Title: Intermediate Italian textbook

Project Description:
I am seeking UTRA support for the development and publication of an Italian language textbook that I am authoring for the educational platform Top Hat. Designed in accordance with the ACTFL Proficiency Guidelines, the textbook provides accessible, engaging, and pedagogically sound instruction for learners at the low- to high-intermediate levels of Italian language and cultural proficiency. The selected student will support the project by uploading, formatting, and reviewing content on the Top Hat platform, working closely with me and with educational media producers from the Sheridan Center Digital Learning and Design.

Required qualifications: N/A

Preferred qualifications: Preference will be given to students with prior experience in Italian, particularly those who have completed at least one course in the ITAL 300–600 sequence.

Is this project for more than one student: No

Karin Wulf
Department: John Carter Brown Library
Project Type: Research
Project Title: Brown at the Bicentennial

Project Description:
For Brown 2026, we are exploring the history of the university community during the bicentennial year (1976). The project will use a wide variety of sources to establish the presence of the bicentennial on campus and off. A component of the fall research will be seeking interviews with the class of 1976.

Required qualifications: Experience with research for a history or other humanities or social science course.

Preferred qualifications: Preference for added depth of knowledge through history courses.

Is this project for more than one student: No

Felix Kpogo

Department: Linguistics
Project Type: Research
Project Title: Crossing Linguistic Borders: Immigrant Speech and New England Dialects

Project Description:
Geographical mobility is a widespread phenomenon around the world. When people move from one region to another, differences in speech often become apparent—even among individuals who speak the same language. In many cases, people adjust aspects of their accents after relocating, for a variety of reasons. But what kinds of changes do mobile speakers make, and why do these changes matter? Research on language accommodation and second dialect acquisition (SDA) shows that geographically mobile speakers often adopt specific dialect features in ways that reflect the complex interaction of linguistic, social, and developmental factors in language use (Nycz, 2015). This research explores what features of New England American English are adopted by English-speaking immigrants from other global Englishes when they move to the region. It focuses on salient regional features such as: /r/ deletion after vowels (e.g., car → cah), and the MARY-MARRY-MERRY vowel merger.

We will investigate key questions such as:

Do English-speaking immigrants converge on New England English norms?

What linguistic or social factors predict the adoption of these features?

Do immigrants value all features equally, and what are their attitudes toward using them?

Ultimately, this study contributes to a broader understanding of how language is learned and adapted among mobile speakers, enriching our knowledge of sociolinguistic variation and change.

Required qualifications: Students with an Introductory level knowledge in Linguistics are preferred, but not required.

Preferred qualifications: Introduction to Linguistics; Experience with doing interviews; PRAAT software; coding/programming skills; strong writing skills.

Is this project for more than one student: Yes

Jaime Benheim
Department: Linguistics
Project Type: Research
Project Title: Voice quality in interaction

Project Description:
Creaky voice (or “vocal fry”) is a voice quality that has come under meta-linguistic discussion in the public sphere due to its association with young women. Despite this commentary, this feature is in actuality used by speakers of all genders, raising questions about the source of this ideological link with young women’s speech in particular. More recent work has suggested that creak can be used to convey information about a speaker’s affect or epistemic stance towards the conversation topic, which perhaps mediates the link to

gender. This project investigates the use of creaky voice in a dataset of audio-recorded interviews with residents of Providence, RI, where impressionistic observations have revealed pervasive creak among young speakers across genders. This is part of a larger project on language in Rhode Island, which you can learn about here: https://sites.brown.edu/rilang/

The student will assist with the quantitative analysis of this data in order to better understand the social functions of creak and whether this represents a linguistic change over time (by comparing older and younger speakers). The student will assist with the following tasks: 1) compiling a literature review of relevant past research, 2) quantitative coding of voice quality in interview data, 3) qualitative coding of interview transcripts, and 4) regular meetings with the PI regarding the project. Depending on student interest, there is also the possibility of assisting with participant recruitment to help balance the demographic representation of the sample. The student will receive training in mixed-methods research methodologies, sociolinguistic theory, and in Praat, a software program used by linguists to analyze auditory data.

Required qualifications: Attention to detail, ability to work independently and as a team, and ability to meet deadlines. Due to the auditory nature of the data, students must be able to hear conversational speech played through computer speakers or headphones

Preferred qualifications: Past or concurrent coursework in linguistics (especially phonetics, phonology, and/or sociolinguistics) is a plus

Is this project for more than one student: Yes

Scott AnderBois
Department: Linguistics
Project Type: Research
Project Title: Making a dictionary of A'ingae, an indigenous language of Amazonia

Project Description:
Over the past 8 years, the A'ingae Language Documentation Project (ALDP) has collected a large collection (https://cofan-aldp.github.io/LingView/#/about) of annotated audio/video recordings of traditional narratives, oral histories, autobiographies, and other interviews in A'ingae (an indigenous isolate language spoken in Amazonian Ecuador). The ALDP team comprised of academics, US-based students, and A'i community members continues to expand this resource as well as using it to answer scientific questions about the language's grammar and to meet community language goals (e.g. creating pedagogical materials).

One central focus of our team at present is the creation of the first comprehensive bilingual A'ingae-Spanish dictionary. A dictionary brings together information about the various grammatical systems of a language with culturally specific information about the words of the language and the concepts they encode. In a practical sense, a dictionary serves a vital role for educators and community members invested in the vitality of a language and its maintenance or revitalization across diverse contexts.

Students in this project will work in partnership with A'ingae-speaking collaborators to ensure that Spanish

definitions and examples include relevant cultural information, have necessary images accompanying them for some entries, are intelligible, and are properly edited lexicographically (e.g. avoiding circularity, separating subsenses). Depending on background and interest, students can additionally choose to focus on works in specific topical domains (e.g. a student with interest in ethnobotany could focus on plant terminology) or on specific grammatical domains (e.g. investigating parts of speech in A'ingae to include in the dictionary). Overall, students will gain experience in lexicography, community-engaged scholarship, and the linguistics of an understudied indigenous language.

Required qualifications: Solid Spanish language proficiency and either Introduction to Linguistics (LING 0100/CLPS 0300) or other relevant course background in other disciplines (e.g. in Linguistic Anthro, Comparative Literature, Hispanic Studies, Native American and Indigenous Studies)

Preferred qualifications: Native fluency in Spanish

Is this project for more than one student: Yes

Jeremy Warner
Department: Medicine and Biostatistics
Project Type: Research
Project Title: Collaboration Networks of Cancer Clinical Trialists

Project Description:
Randomized clinical trials of cancer treatments are large and complex interventions, and provide the gold standard for cancer care. We have previously examined some aspects of the collaborative co-authorship network of persons that conduct these trials (see PMID 33067482, Li et al. 2020), and propose to expand this research. In particular, we are interested in examining geographic patterns over time, including growth of clinical trial epicenters in China and other ex-US/Europe locations. We also have information on trial sponsorship and the drug(s) being studied, which we expect to provide further information on influencers and key collaborators in the co-authorship network. This research will be enabled by the HemOncKB, a large knowledge base of cancer treatments and guidelines maintained by the Warner lab/CCIDS.

Required qualifications: N/A

Preferred qualifications: R is strongly preferred, as it would be necessary to conduct the project. It can be learned as part of the experience.

Is this project for more than one student: No

Hongwei Yao
Department: Medicine and Molecular Biology, Cell Biology, & Biochemistry
Project Type: Research
Project Title: Metabolic dysregulation in right ventricle of pulmonary hypertension

Project Description:
Pulmonary arterial hypertension (PAH) is a disease that causes remodeling of the right ventricle (RV) and increases its afterload. Chronic pressure overload stimulates RV hypertrophy, which can compensate for the increased afterload and maintain cardiac output. Persistent RV hypertrophy could create RV ischemia and lead to RV failure. RV dysfunction is the strongest predictor of mortality in PAH. Unfortunately, no currently available PAH therapy directly targets the RV. Therefore, there is an unmet need to combat the mechanisms underlying RV dysfunction directly to improve long-term outcomes in PAH. Dysregulated metabolism is observed in the RV of patients with PAH. Previous studies suggest complex and cell-specific alterations of metabolism in the RV of PAH. Understanding cell-specific metabolic dysregulation in the RV adaptation and maladaptation of PAH will help uncover new mechanisms and develop targeted therapies for this disease. Endothelial cells (ECs) account for approximately 60% of non-cardiomyocyte cells in the heart. Roles of EC function and their metabolic reprogramming in mediating the transition from RV adaptation to failure are unknown. In this study, we will test the hypothesis that RV endothelial metabolism is dysregulated, thereby causing RV inflammation and dysfunction in PAH.

Required qualifications: N/A

Preferred qualifications: N/A

Is this project for more than one student: No

Lynne Joyrich
Department: Modern Culture and Media
Project Type: Course Development
Project Title: Television Studies Course Development

Project Description:
This Faculty/Student collaboration will work to revise courses and develop curriculum in the area of Television and Media studies. Television remains a dominant medium of our culture and our era—even, or especially, in this time of media convergence, when streams of televisual material can be accessed not only on traditional television sets in the home but on everything from giant screens on the street to small hand-held devices that we constantly carry. This omnipresence, and the way in which televisual media thus impact our times and spaces, our encounters and experiences, and our very modes of seeing and thinking, make the study of television urgent. Yet televisual formations (and the media with which they interact, such as online video) are constantly changing in this quickly developing media environment, and so Television and Media Studies is a rapidly shifting scholarly field. This UTRA is thus designed to review, revise, and renew courses offered in the Department of Modern Culture and Media in the area of Television Studies (possibly including such courses as Introduction to Television Studies; TV and Race in America; Television, Gender, and Sexuality; and/or Television Realities) in order to update their readings and screenings, bringing in new scholarship and new media material.

Student tasks will include: assessing course material; searching for potential new readings and screenings, with particular emphasis on enhancing media material by locating current programming options; collaborating in the composition of screening notes; and assisting in course conceptualization

and (re)design. In turn, the student will broaden and deepen their understanding of media studies.

Required qualifications: At least two courses in areas related to Television and Media Studies.

Preferred qualifications: Some basic video production skills would be useful.

Is this project for more than one student: No

Phyllis Dennery
Department: Molecular Biology, Cell Biology and Biochemistry
Project Type: Research
Project Title: Exploring therapies to prevent BPD via the SASP

Project Description:
Bronchopulmonary dysplasia(BPD) is a chronic lung disease that affects premature infants and has long term consequences. Our group focuses on understanding what leads to BPD in premature infants exposed to oxygen and mechanical ventilation, which are life sustaining but have adverse effects. We have recently discovered that one of the hallmarks of BPD lung injury is senescence, or premature aging. ThiS occurs in the lung macrophages predominantly. We hypothesize that macrophage senescence leads to lung alveolar and vascular simplification through the release of senescence associated secretory proteins(SASP) and their downstream targets. We want to clearly define which targets are responsible and how can they be blocked. We will focus on evaluating the components of the SASP that can be suppressed or blocked as therapeutic strategies. The work is conducted in cells in culture and in mice exposed to high oxygen concentrations as well as in lung tissues from lambs that have been exposed to mechanical ventilation and high oxygen provided by one of our collaborators.
Generation of therapeutic strategies to block the deleterious effects of hyperoxia and ventilation through inhibition of the SASP targets is novel. This project will have a significant impact because it will lead to the development of novel precision targeted therapies that clear senescent macrophages or suppress expression of SASP factors in neonates to treat BPD.
The project will allow the student to learn new laboratory techniques and to analyze data and present their findings at our laboratory meetings as well as at regional meetings if progress permits.

Required qualifications: Courses in cell biology and molecular biology

Preferred qualifications: Experience with basic laboratory techniques is preferred.

Is this project for more than one student: No

Alvin Huang
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Exploring CHI3L1/YKL-40 as a master switch of neuroinflammation in Alzheimer's Disease

Project Description:
Neuroinflammation is now recognized as a key driver—not just a by-product—of Alzheimer's disease (AD) progression. Among the most consistently elevated inflammatory molecules in the brains and cerebrospinal fluid of patients is CHI3L1/YKL-40, a secreted glycoprotein produced mainly by activated astrocytes and microglia. Large-scale human genetics, biomarker studies, and our own work in demyelinating disorders all point to CHI3L1 as a potent modulator of glial behavior, yet its precise actions in the AD milieu remain poorly defined.

This UTRA project will use human induced pluripotent stem cell (iPSC) technology to generate isogenic astrocytes, microglia, and neurons carrying AD-relevant mutations. Students will (i) manipulate CHI3L1 levels with CRISPR activation/knockout and recombinant protein, (ii) track downstream inflammatory signaling and synapse integrity with multiplexed ELISA, RNA-seq, and high-content imaging, and (iii) test small-molecule or antibody blockers of the CHI3L1 pathway. The goal is to define whether CHI3L1 acts as a "master switch" that tips glia toward neurotoxic or neuroprotective states—knowledge that could reveal a new therapeutic entry point for slowing Alzheimer's disease.

Required qualifications: Course work in biology; some knowledge of basic laboratory techniques; interest in neuroscience and cognition

Preferred qualifications: Advanced coursework in cell biology, molecular biology, and genetics; past work in PCR, histology, cell culturing with iPSC and other laboratory techniques; interest and/or past research experience in a disease-related context

Is this project for more than one student: No

Mandar Naik
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Identification of relative domain orientations in a modular protein using NMR residual dipolar couplings.

Project Description:
Mitochondrial branched-chain α-ketoacid dehydrogenase complex (BCKDC, 4 MDa) is a highly conserved multienzyme complex responsible for oxidative decarboxylation of branched-chain α-ketoacids derived from leucine, isoleucine, and valine. This project will study the structure of the dihydrolipoyl transacylase (E2) enzyme using Nuclear Magnetic Resonance (NMR) spectroscopy. The E2 consists of three independently folded domains, the N-terminal lipoyl-bearing domain (LBD), the interim E1/E3 subunit-binding domain (SBD), and the C-terminal inner core domain (ICD). The lipoyllysine residue on the LBD domain is responsible for the "swinging arm" coupling mechanism behind the BCKDC enzymatic activity. The relative orientations of LBD and SBD domains will be studied using NMR residual dipolar couplings (Please see the methodology published in Naik et al., J Struct Biol, 216 (4), 108138, 2024) The student will prepare isotope-enriched recombinant proteins and acquire NMR data in weak alignment media. He/she will acquire and analyze NMR data. This project is meant to train students in structural biology and biophysics with significant exposure to computational analysis. This is a lab project with no remote component. The laboratory is located in the Jewelry district near Warren Alpert Medical School.

No prior experience is required for this project.

Required qualifications: Interest in biochemistry and biophysics research

Preferred qualifications: EHS lab safety training is encouraged

Is this project for more than one student: Yes

Mandar Naik
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Characterization of peptide binding orientations using NMR paramagnetic relaxation enhancements.

Project Description:
Post-translational modification by Small Ubiquitin-like Modifier (SUMO) has emerged as an important cell signaling mechanism. SUMO-modified proteins are identified by the binding partner using a SUMO Interaction Motif (SIM) present on the partner protein. SIM is a small patch of hydrophobic residues followed by a stretch of acidic and polar residues. SIMs can bind either in parallel (e.g. PIASx) or anti-parallel (e.g. RanBP2 M-IR2) orientation to the cleft between the second beta-strand and alpha-helix on the SUMO surface. This project will use Nuclear Magnetic Resonance (NMR) spectroscopy to describe residue-specific interactions and probe binding orientations of Daxx SIM peptide bound to SUMO-1 and SUMO-2/3. This project will utilize the paramagnetic relaxation enhancement (PRE) effect that leads to broadening NMR resonances in the proximity of a free electron. (Please see the prior work published in Chang et al., Mol Cell, 42 (1), 62, 2011). The student will prepare isotope-enriched recombinant SUMO proteins and label synthetic SIM peptides using a spin label. He/she will acquire and analyze NMR data. This project is meant to train students in structural biology and biophysics with significant exposure to computational analysis. This is a lab project with no remote component. The laboratory is located in the Jewelry district near Warren Alpert Medical School. No prior experience is required for this project.

Required qualifications: Interest in biochemistry and biophysics research

Preferred qualifications: EHS lab safety training is encouraged

Is this project for more than one student: Yes

Mark Johnson
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: The pollen tube: adaptation to climate change at the cellular and molecular level

Project Description:

Changing agriculture to mitigate and adapt to climate change will require understanding how plants respond to environmental stress at all biological levels from the molecular/cellular to the ecosystem. This project focuses on developing the pollen tube as a system to understand how plant cells respond to temperature stress and to define gene variants and pathways that confer tolerance to high temperature stress. The pollen tube is a single microscopic cell that extends at astounding (up to cm/hour) rates to achieve the essential function of delivering sperm to female gametes for fertilization. This cellular journey, which is essential for crop production (corn, wheat, rice, tomato, etc.), fails when temperatures exceed narrow tolerances. Using live imaging and genome-scale analysis of gene expression, we have found that cell wall integrity is a key pathway for reproductive success at high temperature. A key finding is that varieties of tomato bred to produce fruits at high temperature have pollen tubes that can maintain the integrity of their cell wall - pollen tubes from other varieties explode under temperature stress. We have begun to analyze cellular and molecular pathways that modulate cell wall integrity with the goal of developing strategies to engineer thermotolerant pollen tube growth. This team is taking a combination of genetic (CRISPR-cas mutagenesis, transgenesis), genomic (RNA-seq analysis, mapping by sequencing), biochemical, and imaging (live imaging of pollen tube growth) approaches.

Required qualifications: a commitment to learning about the research process and building research skills, work experience, experience setting goals and keeping records, experience working as part of a team, introductory coursework in Biology and/or Chemistry

Preferred qualifications: basic molecular biology (PCR, gel electrophoresis), Bioinformatics (experience with R), microscopy/imaging/image analysis, making chemical solutions. Some of the following courses would be helpful: Biol 0470, Chem 330, Biol 0500, Biol 0280

Is this project for more than one student: No

William Holmes
Department: Molecular Biology, Cellular Biology, and Biochemistry/Biology Education
Project Type: Course Development
Project Title: Catalyzing Collaboration: Peer-Led Innovation in Biochemistry Education

Project Description:
This project aims to enhance BIOL0280, a large foundational biochemistry course, by integrating Peer-Led Team Learning (PLTL) into its existing structure. The objective is to enrich the learning experience by incorporating structured, peer-facilitated problem-solving sessions that complement lectures and deepen student engagement with biochemical concepts. The course will be modified by training undergraduate teaching assistants to lead these small-group workshops to promote active learning, collaboration, and more inclusive participation, particularly in a high-enrollment setting.
Examples of Tasks for Student Participants:
Undergraduate students working on this project will:

- Collaborate with the course instructor to design and test PLTL workshop materials, including conceptual questions, problem-solving activities, and real-world case studies that align with course content.
- Participate in developing facilitator training modules, focusing on inclusive teaching strategies, group dynamics, and scientific communication.
- Assist in assessing learning outcomes, using surveys, reflective writing, and pre/post-test data to

evaluate the impact of PLTL on student understanding and confidence.
- Pilot PLTL workshops with small student groups and gather participant feedback to revise materials and improve session effectiveness.
- Develop a logistical and pedagogical framework for PLTL in BIOL0280

Skills and Knowledge the Student Will Develop:
Through this experience, undergraduate student team members will:
- Deepen their biochemical content knowledge by developing and teaching peer-based workshop materials.
- Gain experience in scientific pedagogy, learning evidence-based teaching techniques and strategies to support student learning.
- Build leadership, collaboration, and facilitation skills, especially in managing group discussions and supporting peer learners.
- Develop project management and assessment literacy, including designing evaluation tools and analyzing student feedback.

Required qualifications: • Completed BIOL0280 • Strong interest in peer teaching, science education, or curricular development. • Willingness to engage in collaborative group work, receive feedback, and reflect on pedagogical strategies. • Dependability, professionalism, and strong communication skills, especially in a team setting.

Preferred qualifications: • Prior experience as an Undergraduate Teaching Assistant (UTA), particularly in biochemistry or related life sciences courses.
- Completion of upper-level coursework in biochemistry or molecular biology (e.g., metabolic biochemistry, structural biology, or biochemical techniques).
- Familiarity with active learning strategies or instructional models such as Peer-Led Team Learning (PLTL), flipped classrooms, or case-based learning.
- Interest in pursuing future roles in education, mentoring, or academic leadership.

Is this project for more than one student: Yes

Enongo Lumumba-Kasongo
Department: Music
Project Type: Research
Project Title: Black Music Lab

Project Description:
Professor Lumumba-Kasongo is interested in working closely with students who can provide administrative and research support for the Black Music Lab (BML) at Brown. The Black Music Lab is a BAI supported initiative that brings together faculty, staff, and students as well as artists and organizers from the greater Providence community who are invested in the study and practice of African and African diasporic musics. Professor LK is looking for students to help develop, plan, and execute BML programming, reach out to potential collaborators, manage the listserv, and provide research support for projects that fall under the purview of the BML.

Here is a link with more details: https://arts.brown.edu/programs/black-music-lab

Required qualifications: Students must be organized and self-directed. Administrative experience is not expected, but is a plus.

Preferred qualifications: Preference will be given to students with a demonstrated knowledge and interest in the study and performance of black musics. Greater consideration will be given to students whose previous coursework includes any of the courses on the Black Music Lab website: https://arts.brown.edu/institute/research/black-music-lab

Is this project for more than one student: Yes

Enongo Lumumba-Kasongo
Department: Music
Project Type: Research
Project Title: NuBlack Music Group: Independent Record Label Development

Project Description:
For this project student(s) will be joining Professor Lumumba-Kasongo and her collaborator Kelechi Aharanwa (current Senior A&R at Columbia Records) in rebuilding NuBlack Music Group, a small independent record label they developed in 2009. Students will provide research and administrative support in the form of filing and organizing documents, researching trends in the music industry, attending meetings and taking notes, helping to manage audio files and projects and potentialy providing feedback on musical arrangements and compositions.

Required qualifications: Strong passion for and knowledge of the music industry, leadership experience on or off campus, excellent verbal and written communication skills as well as effective problem solving and organizational skills.

Preferred qualifications: Music and/or video production skills, past coursework includes any of the classes on the Black Music Lab website: https://arts.brown.edu/programs/black-music-lab

Is this project for more than one student: No

Genevieve Allotey-Pappoe
Department: Music
Project Type: Research
Project Title: Black Music Nomad

Project Description:
The Black Music Nomad is a podcast that explores Black music through the experiences and untold stories of people working in a range of musical environments across the globe. Through conversations with musicians, DJs, and producers in Europe, Asia, and the rest of the world, the podcast explores the histories and trajectories of Black music genres as well as the various reinterpretations and remediations

of Black music in these locations. The goal of the podcast is to map and highlight the influence of these musical styles in different contexts and the significant role of Black musicians and DJs in the circulation of music. The podcast is available on Spotify, Apple, and Google podcasts. The ideal student for this project is someone who is enthusiastic about music and is interested in conducting research on the influence of Black music genres outside the USA. Through research, the student will work with the professor to create a list musicians, DJs, and producers working in different parts of the world and set up interviews with some of these musicians. The student will also manage the social media accounts for digital advertisement and communication. For more information, please visit the website podcast (www.blackmusicnomad.com) or the Instagram page (@black.music.nomad)

Required qualifications: N/A

Preferred qualifications: N/A

Is this project for more than one student: No

Genevieve Allotey-Pappoe
Department: Music
Project Type: Course Development
Project Title: The Music Industry

Project Description:
This project supports the development of a new course centered on the music industry. This course will be designed to provide students with both a comprehensive overview of the music industry and a deeper understanding of how the industry has evolved over time. We will explore the history and structure of the music industry, examine popular and academic discourse, and consider the implications of technological innovation.
The student will work closely with the professor on research, course design, and the creation of educational resources that merge academic study with practical knowledge. Topics may include copyright and publishing, the evolution of recording technologies, artist development and emerging technologies. This is an exciting opportunity for a student interested in the music business. The student will help organize materials for an engaging and up-to-date curriculum.

Required qualifications: N/A

Preferred qualifications: N/A

Is this project for more than one student: No

Mack Scott
Department: Native American and Indigenous Studies Initiative
Project Type: Research
Project Title: Tall Oak Weeden Archive

Project Description:
This project is for a student interested in developing skills and gaining experiential knowledge about museum curatorial and archival practices. The Research Assistant will work closely with Native American and Indigenous Studies faculty and John Hay Library staff to document and organize materials in the Tall Oak Weeden collection to make the materials more accessible for researchers, students, and community members. Specifically, the Research Assistant will assess, organize, describe, label, and provide information about collection materials and prepare a research talk/presentation detailing their experience. The Research Assistant may offer various other editorial, administrative, and organizational support for the project as needed.

Required qualifications: Excellent communication, writing, research, organizational skills, and the ability to work independently and collaboratively are essential.

Preferred qualifications: N/A

Is this project for more than one student: No

Liqi Shu
Department: Neurology
Project Type: Research
Project Title: Clinical Neurotechnology: Building Movement Databases and Assessing Diagnostics for Neurological Disorders

Project Description:
This project offers an immersive clinical research experience in neurotechnology, where students will work on two pivotal studies aimed at enhancing neurological care. In the first project, Neurological Disorder Motor Database, students will establish a foundational video database by recording patients with neurological disorders performing basic motor tasks. This dataset will support future research on movement patterns potentially linked to neurological conditions, enabling the prediction of movement trajectories and informing early diagnosis. Students will actively recruit and consent patients, collect video data during clinical visits, and contribute to the organization and management of this kinematic resource.

In the second project, EEG LVO Prehospital Detection, students will participate in a study evaluating the effectiveness of portable EEG systems in prehospital settings to detect large vessel occlusion (LVO) strokes. Working closely with EMS, Emergency Department, and Neurology personnel, students will assist in gathering EEG data from patients exhibiting stroke symptoms. Their roles will include obtaining consent from patients or family members, collecting and organizing EEG data, and contributing to data management. This research has the potential to improve prehospital stroke care, optimizing patient outcomes by identifying LVO strokes earlier and more accurately.

Through these dual projects, students will gain first-hand experience in patient interaction, recruitment, consent processes, and data collection in both clinical and acute care environments. Additionally, they will be exposed to neurotechnology applications, including computer vision for kinematic analysis and portable EEG systems. This combined opportunity allows students to work at the interface of neurology, data science, and clinical care, contributing to research that may shape the future of diagnostic

neurotechnology.

Required qualifications: Strong interpersonal skills and a genuine interest in patient interaction. Basic understanding of data collection methods and ethical research practices. Ability to work attentively and responsibly within clinical settings

Preferred qualifications: Experience with clinical research. Familiarity with video data processing, computer vision, or EEG data analysis.

Is this project for more than one student: Yes

Liqi Shu
Department: Neurology
Project Type: Research
Project Title: Neurotechnology: Enhancing Medical Care through Machine Learning and Computer Vision

Project Description:
In our neurotechnology research at Brown University's Neurology Department, we are dedicated to leveraging advancements in computer vision, machine learning, and large language models to revolutionize medical care. Our diverse range of projects includes kinematic analysis of stroke recovery, real-time medical conversation analysis and pre-hospital stroke triage using EEG. By integrating these technologies, we aim to develop sophisticated tools for assessing and enhancing stroke rehabilitation, as well as improving the accuracy and efficiency of neurology documentation and consultation. Our approach is multidisciplinary, combining clinical insights with cutting-edge computational techniques to create innovative solutions for complex medical challenges. This program offers students the opportunity to be at the forefront of neurotechnological research, contributing to projects that have the potential to significantly impact patient care and treatment outcomes.

Required qualifications: Proficiency in programming (Matlab/Python) Fundamental knowledge of machine learning and data analysis

Preferred qualifications: Experience with computer vision, audio processing, natural language processing, or large language models

Is this project for more than one student: Yes

Saud Alhusaini
Department: Neurology
Project Type: Research
Project Title: The correlation between genetic risk factors and subclinical phenotypes in common movement disorders

Project Description:
This project offers the opportunity to work with movement disorders patients (e.g., Parkinson's disease and essential tremor) to collect genetic, neuropsychological, neuroimaging, and electrophysiological data. Our aim is to understand the correlation between disease genetic risk variants and subclinical phenotypes. For more information about our work, please visit: https://sites.brown.edu/alhusaini/

Required qualifications: Basic programming skills and ability to communicate effectively with patients and their caregivers

Preferred qualifications: Experience in Matlab and R are preferred

Is this project for more than one student: Yes

David Sheinberg
Department: Neuroscience
Project Type: Research
Project Title: Simulating motion with our eyes

Project Description:
In this project we ask what happens when people imagine something moving. In particular we want to know if microscopic eye movements indicate that brain circuits involved in tracking real moving objects are present even when there is only imagined motion. The project involves use of a new system for tracking eye movements and analysis of behavioral and eye movement data. Current models of slow eye movements suggest that these can only occur in the presence of real motion. This study will ask if certain task conditions and highly sensitive measures may reveal that this long held belief is not correct.

Required qualifications: Some computer science experience; willingness to work on a team

Preferred qualifications: Working knowledge of probability and statistics; basic knowledge of sensory processing

Is this project for more than one student: No

Elena Oancea
Department: Neuroscience
Project Type: Research
Project Title: Light detection and signaling in human skin melanocytes

Project Description:
The project will investigate the ability of human skin melanocytes to detect and respond to light, in particular to ultraviolet radiations (UV). Our lab identified a UV-activated signaling pathway in melanocytes, but so far could not identify the receptor. This project will test that a nonvisual opsin receptor mediates the UV responses in these cells. We will first test if reducing the expression of the

nonvisual opsin in melanocytes leads to lower or no response to UV. Melanocytes with shRNA targeting the putative receptor will be used for live imaging while undergoing UV stimulation in order to measure their calcium responses. If the nonvisual opsin is the UV receptor, we will investigate how it mediates the UV responses and how it interacts with other receptors and signaling pathways in melanocytes.

Required qualifications: Required background: any cell biology class that included basic knowldge of G-protein coupled receptors and signal transduction; Sterile technique used for culturing cells; very good organization skills; ability to learn and use image analysis software

Preferred qualifications: cell culture and transfection, qPCR, microscopy knowledge and imaging techniques.

Is this project for more than one student: No

James Simmons
Department: Neuroscience
Project Type: Research
Project Title: Sonar guidance of swarming in echolocating bats

Project Description:
Echolocating bats use biological sonar to guide flight and orient to objects in their surroundings. They use sonar to find and intercept insects as well as to navigate through the environment, avoiding obstacles, and following pathways. The most challenging problems occur when multiple bats swarm in one location to hunt for insects clustered together or to take turns swooping down to the water surface over a pond to drink. To participate in a swarm, each bat has to avoid its immediately neighboring bats while also orienting to the insects or the water surface--the task that has to be performed while maneuvering in company with other bats. We have video and acoustic recordings of swarming by bats in numbers ranging from 3-5 bats to over 50 bats, all flying and keeping inside a volume of space no larger than 3-10 cubic meters. The video recordings use thermal-imaging cameras to "see" the bats in the dark. An array of high-frequency microphones is used in conjunction with the video recordings to locate the sources of thesonar sounds emitted by the swarming bats. We will make more videos and sound recordings during the season of bat activity in Rhode Island for the summer and early autumn of 2025. The project is to digitize the locations of each bat frame-by-frame and track their flight paths using DeepLabCut programs running on Brown University's Computational Biology Core supercomputer. Speed of computing for such large data-sets is essential, plus higher-level modeling of the bat's behavior will be done on the same OSCAR system. The immediate goal is to assess the the smoothness of the bats' tracks. The absence of frequent abrupt turns would signify that the bats keep track of each other with enough continuity in time and depth of neighboring distance that near-collision surprises are rare, but the larger scope of the task (caching insects or drinking) still is carried out. The occurrence of frequent abrupt turns would signify the alternative, that their flight is concentrated on the task and only addresses the other bats when a collision is imminent. Recordings of the sonar emissions will show whether typical abrupt collision-avoidance reactions or smooth scene-monitoring behavior occurs. The work has great significance for development of group guidance algorithms for autonomous vehicles such as drones or underwater self-propelled devices guided by radar or sonar.

Required qualifications: The most important required skills are experience using DeepLabCut or similar

software based on Python code and the real-time capabilities of OSCAR. Prior experience with a biological application is important, too.

Preferred qualifications: General computational fluency plus specific use of motion-tracking programs coupled with experience using OSCAR on a biological problem is necessary. Prior coursework on behavior and neural basis of natural sensing and orientation is highly desirable.

Is this project for more than one student: No

Wael Asaad
Department: Neurosurgery & Neuroscience
Project Type: Research
Project Title: Research in Neurophysiology & Neuromodulation

Project Description:
We undertake a variety of neurophysiology and neuromodulation research studies in humans undergoing relevant neurosurgical procedures (e.g., deep brain stimulation for parkinson's disease; intracranial electrodes for seizure mapping; focused ultrasound for tremor, etc.). Our goals are: 1) to understand normal brain circuit function related to various aspects of motor function, cognition, attention, and memory; 2) identify neurophysiological signatures of particular disease states; 3) develop new circuit-modulation strategies to better treat brain disease.

Required qualifications: Students should have some background in neuroscience or cognitive science, be comfortable with quantitative analysis.

Preferred qualifications: Students with solid coding skills (e.g., Python, Matlab, etc.) and strong quantitative skills (e.g., linear algebra, machine learning, etc.), or who are in the process of actively developing these skills, will be given preference.

Is this project for more than one student: Yes

Wael Asaad
Department: Neurosurgery & Neuroscience
Project Type: Research
Project Title: Artificial Intelligence to Advance the Clinical Neurosciences

Project Description:
We have developed a multimodal registry representing the combined clinical experience of the departments of neurosurgery, neurology, and psychiatry and encompassing hundreds of thousands of records. We seek to use this powerful platform to enhance clinical and academic work in the applied neurosciences, including the application of LLMs to summarize clinic notes and patient history, to identify "red flags" and thus serve as an early warning system for clinical care, to accelerate clinical research by more quickly and accurately identifying clinical trial cohorts, etc. We aim to be a leader in the application

of AI to healthcare and are seeking highly motivated, enthusiastic students to contribute to our efforts in this very fast-moving field.

Required qualifications: Existing or developing strong skills in data science, machine learning, applied math, and coding.

Preferred qualifications: Additional strong interest in clinical care, particularly neuroscience, is helpful.

Is this project for more than one student: Yes

Qian Chen
Department: Orthopedics
Project Type: Research
Project Title: Developing Nanopieces antisense oligonucleotides therapeutics crossing the blood-brain barrier

Project Description:
Antisense oligonucleotides (ASOs) are single-stranded deoxyribonucleotide oligomers that knock down gene expression at the post-transcriptional level. ASOs can treat a vast array of neurodegenerative diseases but cannot bypass the blood-brain barrier (BBB), necessitating invasive and inefficient intrathecal injections for clinical applications. A drug vehicle that can cross the blood-brain barrier after intravenous injection and degrade safely after delivery would greatly improve the treatment of brain diseases such as Alzheimer's and Huntington's disease.
Janus base nanopieces (NPs) are a family of drug vehicles formed by two joined DNA bases attached to a positively charged amino acid tail. Bases non-covalently assemble into long strands of nanotubes that wrap around nucleic acid cargo to disguise negative charge. Here, we used NPs to intravenously deliver ASOs across the BBB in mice and tested their efficiency by knocking down the ubiquitously expressed noncoding RNA MALAT1 via RNase H-mediated degradation.
This project will evaluate the time-dependent and dose-dependent efficacy of NP/ASO solutions delivered intravenously in mice. The undergraduate involved in this project will gain familiarity with tissue lysis, RNA extraction, Nanodrop Spectrophotometer measurements, RT-PCR and qPCR. They will also conduct literature research and work closely with peer and graduate mentors.

Required qualifications: N/A

Preferred qualifications: Prior lab research experience including cell and molecular biology, neuroscience, bioengineering or nanomaterial is preferred.

Is this project for more than one student: No

Jennifer Nuzzo
Department: Pandemic Center, Epidemiology, School of Public Health
Project Type: Research

Project Title: Africa Health Security Index

Project Description:
In collaboration with African partners, the Africa Health Security Index (AHS Index) will determine how we can improve the value and benefit of the GHS Index to end users, including through the addition of climate variables and other new indicators. The project aims to enable African leaders to track the impact of actions and programs designed to improve health security on the continent. The student will have an opportunity to attend meetings with the partners in Africa and also meet with our collaborators at Nuclear Threat Initiative (NTI) and Economist Impact (EI). The student will participate in agenda setting, taking notes, and disseminating information to our partners, as well as presenting data if appropriate. The student will learn how to organize professional meetings and interact with partners from all over the world when working toward a collective goal. There will also be opportunities to review and clean data alongside African Universities who serve as Data Review Partners and EI who will collect the data. The final product will be a report of the Africa Health Security Index.

Required qualifications: Required qualifications for this position would be familiarity with the GHS Index as well as experience taking notes for high level meetings.

Preferred qualifications: Preferred qualifications would be familiarity with large data sets, experience with assisting in planning high level meetings, and experience with pandemic preparedness projects on the African continent.

Is this project for more than one student: No

Georgia Lagoudas
Department: Pandemic Center, School of Public Health
Project Type: Research
Project Title: Breathe Easy: How the Public Health Community Can Play a Role in Healthy Buildings

Project Description:
Clean indoor air is critical for human health and wellbeing - it influences how we feel, how we think, and whether we get sick. While we spend 90% of our time indoors, we do not have any health-based standards for indoor air quality. Most buildings are designed for minimum standards for odor and comfort, not health, and the Covid pandemic demonstrated how important the indoor environment is for respiratory disease transmission. The public health community can play a role in promoting healthier buildings and recommending guidelines and policies for cleaner indoor air, especially during times of high risk (such as flu season or elevated wildfire smoke).

In this work, a student will conduct research on policy measures in place for clean air, what state health departments have taken action to promote clean indoor air, and guidelines from the public health community. The student will compile these resources and propose actions from the state health departments for elevating awareness for cleaner indoor air. In this work, the student will research other past examples of public health alerts and campaigns and speak with public health state leaders to gather input. The student will conduct literature review, interview state officials, and outline a proposal for the role of public health officials in effectively promoting clean indoor air.

This public policy project will be grounded in both an exploration of federal and state policies as well as public health measures guided by science.

Required qualifications: Ability to work independently and strong writing and organizational skills.

Preferred qualifications: Experience conducting literature searches and writing summaries of findings. Comfort reading through scientific literature and conducting independent online research.

Is this project for more than one student: No

Georgia Lagoudas
Department: Pandemic Center, School of Public Health
Project Type: Research
Project Title: A Breath of Fresh Air: International Policy Roadmap for Clean Indoor Air

Project Description:
Clean indoor air is critical for human health and wellbeing - it influences how we feel, how we think, and whether we get sick. Yet, most buildings are designed for minimum standards for odor and comfort, not health. While we expect clean water to flow out of our taps, we don't have any standards for the cleanliness of air flowing out of our vents. We do not have health-based standards for indoor air quality nationally and there are minimal international standards. Cleaner indoor air in public buildings will support childhood learning, reduce asthma rates, improve workplace productivity, and reduce respiratory diseases.
In this work, a student will conduct research on policy measures internationally in place for clean air, past proposed legislation, and future public health policies that can be enacted. This work will require review of existing indoor air quality standards internationally, such as at the World Health Organization, and research into individual country-level air quality actions to develop a comprehensive assessment of international standards and policies. The student will conduct literature review, interview government officials, review policy reports, and propose a roadmap and next steps to advance clean indoor air policy internationally. The student may propose initiatives that can be presented as public meetings or published as journal articles. This public policy project will be grounded in both an exploration of local and international policies as well as public health measures guided by science.

Required qualifications: Ability to work independently and strong writing and organizational skills.

Preferred qualifications: Experience conducting literature searches and writing summaries of findings. Comfort reading through scientific literature and conducting independent online research.

Is this project for more than one student: No

Daniel Spade
Department: Pathology and Laboratory Medicine
Project Type: Research

Project Title: **Phthalate effects on Sertoli cell and rete tubular cell morphology**

Project Description:
Phthalic acid esters (phthalates) are male reproductive toxicants that alter the development of the testis at least in part by altering the assembly and differentiation of Sertoli cells. Fetal Sertoli cells are precursors for rete tubular epithelial cells, which are essential for later-life testicular function. This project will investigate how components of the Sertoli cell and rete tubular epithelial cell are expressed and localized in normal rete testis and Sertoli cells and how phthalates alter the expression and localization of these proteins. The approach will include development of co-immunofluorescent labeling protocols for Sertoli cell and rete proteins, SOX9 and AMH, and cytoskeletal proteins, in tissue sections and whole mount fetal testes from animals exposed to phthalates. Additional steps could include in situ hybridization to test for spatial expression patterns of Sertoli cell and rete epithelial differentiation markers.

Required qualifications: Some experience working in a research lab and a knowledge of biology

Preferred qualifications: some prior experience with immunohistochemistry/immunofluorescence/in situ hybridization; knowledge of toxicology

Is this project for more than one student: No

Ece Uzun
Department: Pathology and Laboratory Medicine
Project Type: Research
Project Title: **Predicting Recurrence of Uterine Corpus Endometrial Carcinoma Using Machine Learning Based Models**

Project Description:
This project aims to develop a machine learning model to predict Uterine Corpus Endometrial Carcinoma recurrence using clinical, gene expression, and mutation data from patients. The data will be obtained from cBioportal and the project doesn't require an IRB. The data set contains data from 529 patients with Uterine Corpus Endometrial Carcinoma that I will use to train and test the model.

Required qualifications: Programming skills in Python, PyTorch

Preferred qualifications: Machine learning course

Is this project for more than one student: No

Jeff Morgan
Department: Pathology and Laboratory Medicine
Project Type: Research
Project Title: **Determining the effects of growth factors on an in vitro model of fibrosis**

Project Description:
Fibrosis, a major unmet medical need, affects nearly all organ systems including skin, lung, heart, kidney and liver. Central to fibrosis is the fibroblast, the connective tissue cell found in all organs whose dysregulation during wound healing results in the excessive deposition and accumulation of a collagen-rich ECM that compromises organ function often by altering its biomechanics. As an alternative to the use of animals, the Morgan Lab has developed a 3D in vitro model of fibrosis. This project is seeking two students to work as a team to investigate the effects of two growth factors on cell proliferation, collagen synthesis and tensile properties of this in vitro model. Students will learn to grow fibroblasts, use these cells to form ring-shaped tissues, use microscopy to quantify the dimensions of the tissues, perform tensile testing to measure strength and stiffness of the rings and use a biochemical assay to measure the levels of collagen. Students will learn lab skills and acquire knowledge of cell biology, microscopy, biomechanics and biochemical assays. Students will gain an understanding of the cellular and molecular mechanisms of fibrosis, a major unmet medical. They will also understand the efforts to replace the use of animals in research and the role that in vitro models can play in that replacement. This effort is well within the main thrust of the Morgan lab which is actively using this model. The lab has not yet explored the role of growth factors and so this project can potentially break new ground. After a literature review, each student will select their own growth factor. This will help them take "ownership" of their project while still being a mutually supportive team as they learn together the lab techniques they will need to master to investigate their growth factor choice.

Required qualifications: Background in biology, cell biology and or biochemistry, familiarity with research lab environment and safety, mammalian cell culture experience

Preferred qualifications: Advanced coursework 1000-2000 level in biology, cell biology and or biochemistry

Is this project for more than one student: Yes

Martin Taylor
Department: Pathology and Laboratory Medicine
Project Type: Research
Project Title: Towards Selective Inhibition of LINE-1 in Mice, Dogs, and Humans for Cancer Prevention

Project Description:
This project aims to investigate how reverse transcriptase (RT) inhibitors—originally developed for HIV—affect different classes of retrotransposons in mammals, focusing on humans, mice, and dogs. While, the lab's current data suggest that the beneficial effects of these drugs in humans are largely mediated through suppression of LINE-1 (L1) elements, other RT-encoding elements like HERV-K (a human endogenous retrovirus) may also contribute, either directly or through off-target mechanisms. A major issue is therefore assigning a molecular cause to the beneficial effects of these drugs. In humans, while HERV-K is dead from a mobility perspective, there are still many loci in human genomes that can encode the active RT enzyme. In mice, there are two other classes of active ERV called IAP and MusD. In dogs, there are many options that can be looked into, and the catalog of retroelements is less well characterized. Existing inhibitor data suggest that some of the inhibitors used in trials in humans and mice appear to selective towards LINE-1. In dogs, cancer rates are very high, and we are interested to study

RT inhibitors for cancer prevention. Therefore, in collaboration with the Sedivy lab, this project will work to establish and optimize assays to evaluate drug sensitivity of these different retroelements. Assays will be made from existing literature, and we will develop new assays for under-characterized elements such as dog L1 and ERVs. Further, we will assess how efficiently different mammalian cells metabolize the RT inhibitor prodrugs into their active triphosphate forms. This work will contribute to a deeper understanding of the molecular targets and species-specific responses to RT inhibitors, potentially informing therapeutic applications repurposing these HIV drugs to prevent cancer and other diseases of aging.

Required qualifications: Basic chemistry and molecular biology to understand tissue culture, molecular cloning, and inhibitor pharmacology. Strong team skills, as the student will be working in a busy lab environment. A desire to learn new things and learn from mistakes.

Preferred qualifications: N/A

Is this project for more than one student: No

Maayan Leroy-Melamed
Department: Pediatrics
Project Type: Research
Project Title: Sexual and Reproductive Health in Sickle Cell Disease

Project Description:
Sickle cell disease affects tens of thousands of people in the US, predominantly of African ancestry. People living with sickle cell disease experience organ damage throughout their body, including reproductive organs. Reproductive effects of sickle cell disease include delayed puberty, abnormal uterine bleeding and other menstruation-related symptoms, penile dysfunction, and fertility concerns. We are conducting qualitative interviews of adolescents and young adults with sickle cell disease and their parents around topics of sexual and reproductive health such as menstruation-related symptoms, penile dysfunction, and family planning. We are interviewing and transcribing recordings of the interviews and will continue through the summer and fall.
Secondary projects may include assisting with IRB protocol drafts, recruiting, or other activities on related topics in sexual and reproductive health.

Required qualifications: Comfort with comprehensive adolescent sexual and reproductive health

Preferred qualifications: CITI/HIPPAA training

Is this project for more than one student: No

Alexandrea Craft
Department: Pediatrics and Psychiatry and Human Behavior
Project Type: Research
Project Title: Juggling roles

Project Description:
The Juggling Roles study (JRs Study) is funded by the National Institute of Health out of the Directors Office by an early investigator research grant (1DP5OD037403-01) that explores how families cope with navigating parenthood as a NICU parent of an infant born preterm and the return to paid employment soon after their child's birth. We are especially interested in the challenges that low-income working parents face as they manage work and family responsibilities and the toll these stressors may take on new parents' mental health. We want to know how workplace policies and work conditions support and/or discourage new parents at this critical time in their lives. We will recruit 250 NICU families (125 two-parent and and 125 single mothers) and interview them 3 times over the first year of their baby's life (approximately 1-month post NICU birth, NICU discharge and at 12-months corrected age).

Undergraduate RA role and expectations
Research assistants will learn about all aspects of the research process. Weekly lab tasks will primarily include (a) interviewing families in the NICU (b) transcribing participant interviews, (b) assisting Dr. Craft and the research team in maintaining a thorough and accurate database, and (c) meeting weekly with the research team to discuss our work as well as relevant research.

In order to complete these tasks, students will be trained to conduct family interviews in the NICU as well as transcribe and code open-ended audio recorded interviews from participants. In addition, students will be trained to assist the research team in data checking and other forms of data management. At times, students may be asked to conduct literature searches and conduct clerical tasks (i.e., organizing research materials). All students will attend weekly project meetings with Dr. Craft and the research team.

Required qualifications: N/a

Preferred qualifications: N/a

Is this project for more than one student: Yes

Sheryl Kopel
Department: Pediatrics; Psychiatry
Project Type: Research
Project Title: Pediatric Health Disparities Research Program

Project Description:
The Pediatric Health Disparities Research Program is directed by Drs. Daphne Koinis Mitchell, PhD and Elizabeth McQuaid, PhD, ABPP. The lab conducts research studies examining disparities in health outcomes and develops and evaluates interventions to improve health and sleep outcomes in youth. Studies investigate sleep, immune function, obesity, and asthma outcomes in children with asthma and allergy living in urban environments in greater Providence, RI.

UTRA students will have the opportunity to shadow full-time research assistants, assist with data collection, and attend weekly research staff meetings as well as the monthly lab meetings, in which faculty and fellows affiliated with the group present ongoing research.

Specific tasks will include assistance with research participant recruitment and scheduling for studies, as well as assisting with a limited amount of data collection (e.g., administering questionnaires to child research participants and their caregivers) and with other tasks integral to research (e.g., preparing graphs and tables of results, preparing materials for research sessions, some clerical tasks, etc.).

Required qualifications: Strong multitasking and time management abilities, critical thinking, and collaboration within an interdisciplinary team. Strong communication skills, meticulous attention to detail. Proficiency in relevant computer applications for research purposes and/or an ability and willingness to learn new applications as needed (i.e., Microsoft Office 365, REDCap, SPSS, ASANA). Experience working in ethnically, culturally, and racially diverse environments.

Preferred qualifications: Spanish fluency. Valid driver's license and one's own car

Is this project for more than one student: Yes

Greg Landsberg
Department: Physics
Project Type: Research
Project Title: Rediscovering Higgs Boson with the CMS Open Data

Project Description:
We will use the Open Data portal of the CMS experiment at the CERN Large Hadron Collider to rediscover Higgs boson. The set of python notebooks developed for this purpose would serve as a valuable outreach tool for teachers and students. The project involves mining the CMS Open data and selecting a subsample of events for further processing, and designing the code and plotting tool to display the Higgs boson mass distribution.

Required qualifications: Knowledge of python

Preferred qualifications: General familiarity with particle physics; Mac OS experience and a Mac laptop

Is this project for more than one student: No

Ian Dell'Antonio
Department: Physics
Project Type: Research
Project Title: Galaxy Cluster Stellar Masses in the Near Infrared

Project Description:
While galaxy cluster contain large amounts of dark matter, a not insignificant amount of the mass (about 5%) of the mass is represented by the stars in the cluster's galaxies (and the stars that have been stripped from those galaxies). These stars are mostly old, red stars, which emit most of their light in the near infrared (NIR). Observations with NIR telescopes can measure the amount of starlight and use that

to estimate the mass in stars. In this project, the student will be using images from NASA's WISE and Spitzer satellites to measure the amount of NIR light emitted by the galaxies in the cluster, and estimating the total stellar mass to compare with the dark matter mass being measured by the graduate students in our group.

Required qualifications: some familiarity with python is required.

Preferred qualifications: experience with linux, astropy, and PHYS0270 or the equivalent are preferred but not required.

Is this project for more than one student: No

Jennifer Roloff
Department: Physics
Project Type: Research
Project Title: Characterization of silicon detectors for high energy physics applications

Project Description:
High energy colliders, such as the Large Hadron Collider (LHC), provide a unique opportunity to answer big questions about the universe by studying the fundamental interactions between particles in high energy collisions. In order to optimally utilize the large datasets from the collisions, we rely on state-of-the-art detector technologies. One promising detector being considered for future detectors is low-gain avalanche diodes (LGADs), a type of silicon detector. These detectors have the capacity for incredibly precise timing spatial resolution, making them a powerful tool at a collider experiment. The student will characterize their behavior, including their current and capacitance under different operating voltages, and help set up new systems for testing the spatial and timing resolution of these sensors. Students will also test and develop different algorithms for sharing signals across channels, optimizing for the spatial and timing resolution of the sensors. These studies will be performed on LGADs and capacitively-coupled LGADs with different geometries and characteristics in order to study the complex interaction between the sensor design and their performance. The work will be a combination of hands-on data collection, and data analysis.

Required qualifications: N/A

Preferred qualifications: Basic coding experience

Is this project for more than one student: No

Leenoy Meshulam
Department: Physics
Project Type: Research
Project Title: The Physics of Octopus Skin Patterns

Project Description:
The Renormalization Group (RG) concept, traditionally taught in statistical mechanics to understand how complex behaviors emerge from simpler interactions across scales, provides a beautiful lens to investigate natural patterns. Octopus skin, known for its dynamic camouflage abilities, creates intricate patterns at multiple spatial scales—ranging from tiny chromatophore cells to larger coordinated structures. This project will apply RG-inspired coarse-graining to experimental octopus skin data to investigate how pattern complexity evolves when viewed at progressively larger length scales, seeking possible signatures of scale invariance or characteristic scales of pattern formation.
By quantitatively analyzing how the statistics of chromatophore activation patterns transform under coarse--graining, you will explore analogies between biological camouflage and concepts such as criticality and universality from physics. This project offers an opportunity to use fundamental ideas from statistical mechanics to study a real biological system, deepening theoretical understanding while contributing to research at the intersection of physics and biology.

Required qualifications: Working knowledge of statistical physics, coding proficiency (python / matlab) (preferrably Python / Matlab)

Preferred qualifications: Advanced statistical physics, comfort with mathematical derivations, familiarity with optimization algorithms and inference techniques.

Is this project for more than one student: No

Loukas Gouskos
Department: Physics
Project Type: Research
Project Title: AI and ML in FPGA and ASIC

Project Description:
The project focuses on the development of ultra-efficient AI algorithms for identifying particles responsible for jet formation at the Large Hadron Collider (LHC). This work is crucial for fully exploiting the potential of the LHC by enabling real-time selection and detailed analysis of particle collision data. By enhancing the LHC's capabilities, these developments could lead to major results in particle physics. The project will explore various machine learning architectures, such as Convolutional Neural Networks, Graph Neural Networks, and Transformers, along with model compression techniques. These are vital for integrating advanced algorithms into FPGA (Field-Programmable Gate Array) and ASIC (Application-Specific Integrated Circuit) systems. FPGAs and ASICs are types of integrated circuits. An FPGA is a hardware circuit that a user can program to carry out one or more logical operations, providing flexibility and speed beneficial for real-time data processing. ASICs are custom-built for specific applications rather than intended for general-purpose use, offering high performance and efficiency in energy consumption. These technologies not only enhance the processing capabilities at the LHC but also find applications in other areas of physics, such as gravitational wave detection, and industries such as automotive for self-driving cars and mobile technology. By participating in this project, the student will dive into the sophisticated intersection of AI, machine learning, and hardware implementation, learning to develop solutions that are not only pivotal for particle physics but also transferable to various technological applications.

Required qualifications: Very good knowledge of Python and good experience in AI and ML algorithm

development. Familiarity with hardware description languages like VHDL or Verilog

Preferred qualifications: Understanding of digital circuit design and implementation processes for FPGA and ASIC. Strong background in computer science or electrical engineering

Is this project for more than one student: Yes

Loukas Gouskos
Department: Physics
Project Type: Research
Project Title: Development of the Next Generation of Silicon Detectors for Future Particle Colliders

Project Description:
The next generation of particle colliders, such as the proposed Future Circular Collider (FCC), demands advanced silicon detectors to enable precision measurements and explore Higgs boson interactions. This project offers students an opportunity to contribute to this frontier, focusing on two critical areas:
Simulation of Beam-Induced Backgrounds:
Beam-induced backgrounds challenge the performance of tracking and calorimeter systems, affecting their ability to measure particle interactions accurately. Students will use advanced simulation tools to model and analyze these effects, developing strategies to mitigate their impact. Building on preliminary work with U.S. and CERN collaborators, the students will refine simulations and optimize detector designs, directly influencing future experiments.
Chip and Module Testing:
Silicon detectors depend on high spatial and timing resolution for accurate particle detection. Students will test and characterise new chip technologies using test data collected at CERN Summer 24. This includes performance evaluation, data analysis, and an understanding of the underlying physics and engineering.

Students will: (1) Develop expertise in simulation, data analysis, and experimental techniques. (2) Contribute to innovative detector designs for one of the most ambitious particle physics projects. (3) Collaborate with global leaders, including CERN scientists and U.S. researchers. (4) Gain practical experience with advanced technologies, preparing for future careers in research and industry.

Required qualifications: Good knowledge of Python and C++, basic knowledge of particle physics, interest in detector R&D

Preferred qualifications: Excellent knowledge of Python and C++, Basic knowledge of AI/ML development, data analysis in particle physics, prior experience in detector R&D

Is this project for more than one student: Yes

Matt LeBlanc
Department: Physics
Project Type: Research

Project Title: Building the Tools for Discovery: Open Source Software Developments for Particle Physics

Project Description:
This project offers an opportunity to gain valuable experience in open source software development within the domain of particle physics. Such software is commonly used in analysis of data from the Large Hadron Collider, and contributions to its development and growth from the user community is essential to ensure long-term sustainability.

The student will contribute to existing software repositories by implementing new features, improving data processing capabilities, testing and validating new developments, improving software documentation, etc. The specific developments to be performed will be determined in consultation with interested students, although an emphasis will be placed on software that is related to particle 'jets' (e.g. https://github.com/scikit-hep/fastjet, https://github.com/JuliaHEP/JetReconstruction.jl) and/or applications of Optimal Transport algorithms in particle physics data analysis (e.g. https://github.com/thaler-lab/Wasserstein, https://github.com/caricesarotti/event_isotropy).

This experience will provide practical, real-world experience to a motivated student in software development using C++, Python, and/or Julia in addition to exposure to the cutting-edge particle physics research that is being performed at Brown.

Required qualifications: N/A

Preferred qualifications: Programming experience (C++, python, julia, etc.)

Is this project for more than one student: No

Matt LeBlanc
Department: Physics
Project Type: Course Development
Project Title: Improving Quantum Physics Instructional Labs

Project Description:
Physics 0560 is a key course for physics concentrators that features hands-on experiments in modern physics, emphasizing lab techniques and data analysis. If selected for this UTRA, you will work with past instructors and physics instructional lab staff to critically evaluate and improve existing lab manuals and procedures for clarity and pedagogical effectiveness.

This role involves reviewing materials, refining procedural steps, clarifying concepts, and improving data analysis guidance. Ideal candidates will possess a strong physics background, have good technical writing skills, and interests in physics education & experimental physics. This project offers a valuable opportunity to deepen understanding of modern physics experiments and contribute directly to curriculum development and student success in acquiring essential skills in the lab.

In particular, lab manuals and workflows related to x-ray diffraction and crystallography, the Franck-Hertz experiment, a measurement of the Zeeman effect and experiments related to electron transport may be

revised over the course of this project.

Required qualifications: N/A

Preferred qualifications: Previous completion of Physics 0560 would be a strong asset.

Is this project for more than one student: No

Richard Gaitskell
Department: Physics
Project Type: Research
Project Title: Development of AI Physics Game using Reinforcement Machine Learning and Physics-Informed Neural Nets

Project Description:
The Center for the Fundamental Physics of the Universe (CFPU) Student Machine Learning Initiative (SMLI) in the department of physics invites you to help develop a reinforcement learning (RL) algorithm capable of piloting a ship in the gravitational field of a black hole. Our goal is to create a physics inspired machine learning challenge for students. The primary goal is for this project to serve as a fun and interactive machine learning project that advances students' skill beyond what they would normally develop in the classroom.

The goal of this game will be to control the thrust on a spacecraft that is orbiting a black hole in such a way that one does not enter the black hole or leave the gamespace. This task is made competitive by including additional spacecrafts in the environment that are being controlled by other groups. The idea is that one craft, which is appropriately trained, should be able to influence its dynamics and those of other craft such that it can cause the other craft to enter the black hole or be kicked from the system while staying within the game space itself.

The foundation of our game will be a code that simulates the physics dynamics for the system. We have already established n-body simulation code that will provide the appropriate environment. One could imagine that in this environment there is a landscape of decisions that one could make in terms of applied thrust where the reward is based on the survival of the craft. We have been experimenting with using actor-critic RL to enter a stable orbit where rewards are based on final proximity to the desired orbit. Results so far have been promising but can be greatly improved.

Longer term there will also be opportunities to change the physics model employed from the simple Newtonian mechanics currently employed to something more exotic. Participants can then investigate how their NN learns in a new environment and see what new insights they might gain.

Required qualifications: Past skill, course work, or experience in Python programming and machine learning are required.

Preferred qualifications: Machine Learning model development in TensorFlow or Pytorch is highly desired. Previous experience with reinforcement learning is also preferred.

Is this project for more than one student: Yes

Richard Gaitskell
Department: Physics
Project Type: Research
Project Title: Development of a web client interface and server for an AI Space Physics Game

Project Description:
Center for the Fundamental Physics of the Universe (CFPU) Student Machine Learning Initiative (SMLI) in the department of physics invites you to l help develop a web-based user interface for space game, where users are capable of piloting a ship in the gravitational field of a black hole (space game). Our goal is to create a public-facing user interface that serves the space game to users that login, from a dedicated server, which the student will also build. The primary goal of this project is to help students develop or burnish their web development skills.

The goal of this interface is to allow users to log into the space game and play the game with other users, on a dedicated server. Longer term there will also be opportunities to enhance this interactive environment so that it may be projected onto larger physical spaces and include more users into the game space.

Required qualifications: Skills required are web interface libraries, such as React, are required. Web server experience in Apache, Nginx, or other platforms is also required.

Preferred qualifications: As this project will be serving a machine learning-based game, experience in machine learning is preferable but not required.
UI/UX experience as well as server development experience is highly desirable, whether through course work or personal projects.

Is this project for more than one student: Yes

Peter Andreas
Department: Political Science
Project Type: Research
Project Title: History of the Illicit Global Economy

Project Description:
Adam Smith long ago wrote that the “propensity to truck, barter, and exchange” is part of human nature. He could have added, “licitly or illicitly.” Indeed, Smith’s famous metaphor of the “invisible hand” to describe market forces can be extended to include the illicit traders whose business involves being as invisible as possible. Popular portrayals tend to either romanticize smugglers as daring colorful figures or as malicious shady operators. But either way, they are typically not treated as major movers and shakers in shaping the course of human history. This book project makes the case that we need to place these illicit traders front and center in the story. Far from being peripheral actors, smugglers have helped build

empires, spark revolutions, fuel wars, and globalize capitalism from the shadows. The book retells familiar stories—from state formation and colonial resistance to industrialization and modern consumerism—through the lens of smuggling and anti-smuggling campaigns. What emerges is a hidden history of the modern world, shaped as much by those who break the rules as those who make and enforce them.

Required qualifications: Library research skills, careful attention to detail, good writing and organizational skills.

Preferred qualifications: Preference for history concentrators or students who have taken my course, Politics of the Illicit Global Economy. Language skills also a bonus.

Is this project for more than one student: Yes

Katharina Galor
Department: Program in Judaic Studies
Project Type: Research
Project Title: Children's Drawings from Israel-Palestine

Project Description:
This project will consist of classifying a collection of about 250 children's drawings collected between October 2024 and April 2025 from various communities in Israel, the West Bank, and the Gaza Strip. The digital images will be organized in a database. It will serve as a foundation for several exhibitions planned in the US, Europe, and the Middle East. The exhibition poignantly captures the shared humanity of these children, illustrating their personal experiences amid the complexities of life in conflict zones. It also highlights the stark differences and asymmetries shaped by geopolitical realities. The artwork will be organized into thematic categories—Family and Home, Violence and Loss, Hope and Resilience, Childhood and Innocence, and Identity and Belonging—rather than by community, challenging preconceived notions and emphasizing the common experiences of children from various backgrounds.

Required qualifications: The student/s should have a solid background in the history of Israel and Palestine, the conflict. Knowledge in Hebrew and/or Arabic, good computer skills, are necessary.

Preferred qualifications: Experience with children and the visual art would be an advantage.

Is this project for more than one student: Yes

Anna Yeo
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Dietary Patterns and Asthma in Children (Project DPAC)

Project Description:

We are seeking a research intern to help with a study examining Dietary Patterns and Asthma in Children (Project DPAC). As part of the Pediatric Health Disparities Program directed by Drs. Daphne Koinis Mitchell, PhD and Elizabeth McQuaid, PhD, ABPP, Project DPAC will involve a daily observational protocol to assess dietary quality, quantity, and timing and asthma activity in children living in urban neighborhoods of RI.
UTRA students will have the opportunity to shadow full-time research assistants, assist with data collection, and attend weekly research staff meetings as well as the monthly lab meetings, in which faculty and fellows affiliated with the group present ongoing research. This opportunity will provide excellent research training for those planning to pursue paid research assistantships or graduate studies in psychology, public health, nursing, or medicine.
Specific tasks will include assistance with research participant recruitment and scheduling for studies, as well as assisting with a limited amount of data collection (e.g., administering questionnaires to child research participants and their caregivers) and with other tasks integral to research (e.g., preparing graphs and tables of results, preparing materials for research sessions, some clerical tasks, etc.).

Required qualifications: Strong multitasking and time management abilities, critical thinking, and collaboration within an interdisciplinary team. Strong communication skills, meticulous attention to detail. Proficiency in relevant computer applications for research purposes and/or an ability and willingness to learn new applications as needed (i.e., Microsoft Office 365, REDCap, SPSS, ASANA). Experience working in ethnically, culturally, and racially diverse environments.

Preferred qualifications: Spanish fluency. Valid driver's license and one's own car. Knowledge of research concept.

Is this project for more than one student: No

Elizabeth (Betsy) Tampke
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Cross-Cutting Trauma-informed Peer Aggression and Dating Violence Prevention for Preteens Receiving Intensive Mental Health Services

Project Description:
98% of youth receiving intensive mental health services (IMHS) have Adverse Childhood Experiences (ACEs)—which are a cross-cutting risk factor for peer aggression and teen dating violence (TDV). Preteens (i.e., 11-13 year olds) in IMHS also are at increased risk for violence because of their comorbid mental health problems, which result in emotional and social deficits that inhibit their ability to form healthy relationships and increase their victimization risk. Aggression, which can be proactive (i.e., goal-oriented) or reactive (i.e., defen-sive) in nature, is a leading cause of referrals for IMHS. However, IMHS settings struggle to provide aggression care and existing interventions (1) are not trauma-informed, (2) do not target peer and dating aggression, and (3) do not account for proactive and reactive perpetration. Failure to provide appropriate clinical treatment for aggression results in immediate and long-term negative outcomes for victims and perpetrators. Thus, the cur-rent project aims to develop and evaluate an optimized trauma-informed intervention for youth receiving IMHS which targets peer aggression and prevents teen dating violence for preteens. The goal of Aim 1 is to develop a group-based trauma-informed intervention that targets peer aggression and prevents TDV for preteens in

IMHS (Social skills, Problem Solving, Awareness, Regulation, and psycho-Education: A trauma-informed inter-vention for peer aggression and teen dating violence (SPARE)). Qualitative data from a Preteen Advisory Board and ongoing collaboration with the multidisciplinary team at the Child Partial Hospitalization Program at Bradley Hospital (CP) will be used to develop SPARE. The goal of Aim 2 is to assess feasibility and acceptability of SPARE via a small pilot trial with two cohorts of youth using quantitative and qualitative feedback from preteens and Behavioral Health Staff. Aim 3 will evaluate SPARE's impact on peer aggression, TDV attitudes and behav-iors, and mental health compared to treatment as usual (TAU) by implementing SPARE as a part of regular treatment at two sites of CP. Preteens and their caregivers will provide quantitative data at baseline, CP termi-nation, and 3-month and 9-month follow-ups. This project aligns with NCIPC's research priorities to develop cross-cutting violence prevention programs that address ACEs, youth violence, and TDV and fills a critical gap in psychological care for youth in IMHS.

Required qualifications: NA

Preferred qualifications: Previous research experience, proficiency in microsoft office, transportation, (also would be amazing if Spanish-speaking)

Is this project for more than one student: No

Grace Cushman
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Developing Prevention and Intervention Strategies to Improve Adolescent Health

Project Description:
The student will have the opportunity to work on related projects within our lab. The student will be involved in studies investigating adolescents' and young adults' barriers and facilitators to food allergy management and sleep health in youth with gastrointestinal disorders. The studies take place at Hasbro Children's Hospital. Responsibilities include but are not limited to recruiting eligible families; data collection in the form of questionnaires and focus groups; data organization and entry; and assisting with setup and maintenance of data management. Tasks will need to be completed on-site at Hasbro Children's Hospital or the Coro Building. This opportunity will provide excellent research training for those considering pursuing graduate studies in psychology or public health, as well as those planning to apply to nursing or medical school.

Required qualifications: 1. Ability to function autonomously on a collaborative interdisciplinary team involving research, medical and mental health care 2. Excellent written and verbal communication and interpersonal skills 3. Strong administrative skills and a strong attention to detail 4. Strong computer skills 5. Ability to work harmoniously with diverse groups of individuals

Preferred qualifications: N/A

Is this project for more than one student: No

Laura Korthauer
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Digital cognitive assessment in patients with chronic kidney disease on dialysis

Project Description:
Cognitive impairment is a common but under-recognized complication of chronic kidney disease (CKD), affecting up to 70% of patients across various stages of the illness. Individuals with CKD are at significantly higher risk for developing cognitive problems due to a combination of vascular, metabolic, and inflammatory factors, as well as treatment-related burden such as dialysis. Cognitive impairment in this population is associated with poorer quality of life, reduced treatment adherence, higher hospitalization rates, and increased mortality.

Despite its prevalence and clinical relevance, cognitive impairment is often not routinely assessed in CKD care, in part because traditional neuropsychological evaluations are time-consuming, require trained personnel, and may be inaccessible in many nephrology settings. Digital cognitive assessment tools offer a promising alternative: they are portable, efficient, scalable, and can be administered in outpatient clinics or even remotely.

This project will be supervised by a clinical neuropsychologist (Dr. Korthauer) and a nephrologist (Dr. Ankur Shah). The goal will be to perform brief cognitive screeners with a new, digital cognitive assessment tool and a brief, gold standard assessment in patients undergoing dialysis. The goal is to establish the prevalence of cognitive impairment in this population and to inform treatment recommendations.

Required qualifications: N/A

Preferred qualifications: Prior experience with human subjects research preferred but not required.

Is this project for more than one student: No

Sarah Thomas
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Investigating Adolescent Cannabis Use With Neurobehavioral Methods

Project Description:
We are seeking a student with a dedicated interest in adolescent development, substance use, and mental health to join our research project. This project investigates adolescent reward-related decision-making, how these processes may exhibit brain/behavior differences depending on adolescents' exposure to cannabis use, whether these processes are altered when adolescents who use cannabis have moderate to severe depressive symptoms, and how sleep is affected with cannabis use. Our mission is to identify bio-behavioral processes in the context of adolescent cannabis use that may give rise to later addiction.

The primary objective is to provide the student with comprehensive training and experience conducting human subjects research. Tasks include learning and assisting with research steps: participant recruitment and enrollment, measurement and assessment during research study visits, data preprocessing and analysis, and the dissemination of research findings.

The student will gain hands-on participant experience by joining in-person research visits as part of the Teen Decision-Making Study. This involvement includes the administration of questionnaires to parents and adolescents. Furthermore, the student will have the opportunity to play a role in the preprocessing, organization, management, and analysis of the resulting data. This experience will offer insights into the rigorous process of scientific data quality control, preprocessing, management, analysis, and interpretation, as well as ethics (e.g., working with minors). If interested, there are opportunities to learn programming languages relevant to the preparation and analysis of behavioral and neural data.

The student will engage in weekly journal club discussions of scientific articles. Depending on the student's interests and availability, there may be possibilities for them to explore available data within the lab.

The student is expected to dedicate approximately 10 hours per week, working under the mentorship of Dr. Sarah Thomas and a research assistant. Bi-weekly meetings with Dr. Thomas and research assistants will be held to facilitate discussions regarding progress, goal attainment, and project development.

Please visit our lab website: https://sites.brown.edu/teendecision-makingstudy/welcome/

Required qualifications: Proficiency in Microsoft Suite applications such as Word and Excel, as well as familiarity with Google Suite tools like Google Calendar, Google Voice, and Google Drive. Exceptional interpersonal skills, demonstrating the ability to engage effectively with families and individuals. Excellent communication skills, defined as keeping study team apprised of progress on assigned tasks and schedule changes. Strong time management and organizational abilities, characterized by meticulous attention to detail and the capacity to prioritize tasks when faced with multiple responsibilities. Availability for late afternoons and evenings to attend study visits as required.

Preferred qualifications: 1. Experience with data capture systems or programming, such as REDCap, and familiarity with statistical software like SPSS and R is preferred but not mandatory.
2. Prior experience interacting with adolescents and families in diverse settings is preferred but not obligatory.
3. Previous exposure to research in related fields is welcomed but not obligatory.
4. Knowledge of programming languages, computational modeling frameworks, or neuroimaging.

Is this project for more than one student: Yes

Barbara Jandasek
Department: Psychiatry and Human Behavior, Brown Medical School

Project Type: Research
Project Title: Hasbro Children's Partial Hospital Program

Project Description:
The Hasbro Children's Partial Hospital Program (HPHP) provides interdisciplinary family-based day treatment for youth with co-occurring medical and psychiatric conditions. The Hasbro Children's Inpatient Hospitalization Program (Selya 6) serves a similar patient population requiring a higher level of clinical care. We conduct research collaborating across these levels of clinical care to assess and improve the impact of treatment on youth and families. Fall projects may include entering and analyzing previously collected data and standardizing the survey-based data collection instruments used across the programs. The UTRA student will have the opportunity to shadow graduate research assistants and attend monthly joint research meetings with HPHP and Selya 6 staff. Specific tasks may include assisting with literature reviews, data entry and cleaning, and other tasks integral to research. There may be opportunities for students to assist with posters, presentations, and journal articles. This opportunity will provide excellent research training to undergraduate students with an interest in psychology, medicine, public health, or related fields.

Required qualifications: Strong communication skills and attention to detail. Ability to work independently in a collaborative interdisciplinary team when provided with adequate guidance and support. Familiarity with relevant computer applications for research purposes and/or an ability and willingness to learn new applications as needed (i.e., Microsoft Office 365, SPSS). Willingness to comply with relevant laws and regulations (i.e., HIPAA, Federal Human Subjects Protections). Ability to work in-person at Rhode Island Hospital and attend monthly research meetings on Thursdays (rotating 1-2pm and 4-5pm)

Preferred qualifications: N/A

Is this project for more than one student: No

Michelle Pievsky
Department: Psychiatry and Human Behavior; Pediatrics
Project Type: Research
Project Title: Creating a More Efficient Pathway from Primary to Specialty Care for Children with Developmental Concerns

Project Description:
We are seeking a student to join a research project that seeks to improve the connection from primary care to specialty developmental behavioral pediatric care. Children with developmental concerns, including concerns for autism, benefit from specialty services, and those who receive interventions earlier have better outcomes. However, children wait over two years on average for an appointment with a diagnostic specialist, and there are known racial and ethnic disparities in age of diagnosis and access to resources. Our team has created a pilot program to connect children with autistic traits from Hasbro Children Hospital's pediatric primary care clinic to Children's Neurodevelopment Center (CNDC) for a specialty evaluation. We are looking to expand the program to connect other primary care clinics to CNDC and build partnerships with early intervention and preschool programs in the state. As a next step in this process, we plan on conducting community engagement studios with members of the autism community and other key stakeholders to present our proposal for this collaboration and obtain their

feedback. The SPRINT|UTRA student's role would be to help us create a presentation for the community engagement studios and adapt that presentation for each group of stakeholders. Students who are interested in participating in other research tasks related to the pilot project may complete clinical chart reviews to extract data from the charts of children ages 0-3 who were seen at Hasbro's primary care clinic as part of two clinical control cohorts. Please reach out to Dr. Pievsky (mpievsky@brownhealth.org) if you have questions about the project. Students are encouraged to meet with Dr. Pievsky by Zoom or attend a lab meeting by Zoom to learn more about this and other research projects.

Required qualifications: Strong visual presentation skills, an interest in learning about the research process, HR credentialing as an intern at Brown University Health OR the ability to begin the credentialing process prior to the start of the fall semester

Preferred qualifications: Strong organizational skills, background knowledge of how to conduct research (either through past experience or coursework), interest in community engagement and child development

Is this project for more than one student: No

Shobha Vasudevan
Department: RNA Center, Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Targeting post-transcriptional mechanisms of tumor persistence

Project Description:
Tumors demonstrate heterogeneity, harboring a small subpopulation that switch from rapid proliferation to a specialized, reversibly arrested state of quiescence that decreases their susceptibility to chemotherapy. Quiescent cancer cells resist conventional therapeutics and lead to tumor persistence, resuming cancerous growth upon chemotherapy removal. Our data revealed that post-transcriptional mechanisms are altered, with modification of noncoding RNAs, associated complexes and ribosomes. These control vital genes in cancer and are important for chemo-resistance and persistence of quiescent cancer cells.

Quiescence is understudied and these hidden RNA mechanism changes that are induced by tumor stress conditions, are unexplored, but are unique vulnerabilities in refractory cancer cells that they target to improve patient survival. The primary goal of our research is to characterize the specialized post-transcriptional gene expression and their mechanisms that underlie persistence of resistant cancer cells. In this project, we will elucidate the chemical modification and regulation of key RNAs and ribosomes, by G0- and chemotherapy-induced signaling.A complementary focus is to use these findings to develop RNA-based therapeutics against these mechanisms and their regulation and test if these mechanisms can be subverted to reduce tumor persistence.

The project is an offshoot of a significant study in my lab. Our lab has found how extensive changes in RNA modifications that are specific chemical adducts on RNAs, alter signaling and critical gene expression in cancers, in response to therapy treatment and cancer conditions. The goal of the project is to understand how the RNA modification is increased in chemoresistant cells. If we get rid of the increased modification, chemoresistant cells become susceptible to therapies and can be eliminated, providing an avenue to prevent recurrence. Given the emerging role of RNA modification as major

regulators of gene expression in cancer, and our findings of distinct post-transcriptional gene expression in chemoresistant cancer, investigating the regulation of RNA modification in chemoresistance, provides extensive insights into mechanisms of critical gene expression that promote tumor persistence. The student will learn to treat and work with resistant cancer cells, analyze proteins and RNAs biochemically, and run time courses to study the impact of modifications on tumor survival.

https://vivo.brown.edu/display/svasude5#All

Required qualifications: any past molecular or cell biology lab work or computational work

Preferred qualifications: any past molecular or cell biology lab work or computational work

Is this project for more than one student: No

Daniel Harris
Department: School of Engineering
Project Type: Course Development
Project Title: Course-Based Undergraduate Research Experience in Design Engineering

Project Description:
This project will be focused on revising and improving the project-based learning experience in ENGN 0620: Design Brief to include new Course-Based Undergraduate Research Experiences (CURE), and make other improvements to the project experience based on feedback from students in Spring 2025. The student will solicit and refine project topics based on the needs of research labs and other facilities at Brown (including the Brown Design Workshop) in collaboration with Profs. Harris and Manfredi. The outcome will be specific project problem statements and associated curricular material to be implemented and evaluated during ENGN 0620 in Spring 2026. Prior topics in Spring 2025 included projects from the Brown Libraries, Engineering research labs, Brown Athletics, the School of Public Health, external industry partners, and others.

Required qualifications: Successful completion of ENGN 0030 or 0032.

Preferred qualifications: Successful completion of ENGN 0620. Familiarity and some training with the Brown Design Workshop (BDW). Concentration or interest in Design Engineering.

Is this project for more than one student: No

Ian Wong
Department: School of Engineering
Project Type: Research
Project Title: Profiling Circulating Tumor Cell Heterogeneity using Computer Vision and Machine Learning

Project Description:
Cancer cells exhibit profound heterogeneity in shape and biomarker expression, which remains challenging to profile using computer vision and machine learning. In particular, primary tumors release heterogeneous circulating tumor cells (CTC) into the bloodstream, which then encounter hostile microenvironments en route to forming a metastatic colony in a distant tissue. This project will investigate how cellular behavior and gene expression change based on the tumor microenvironment, by analyzing morphological changes, proliferation rates, and RNA sequencing data. In order to properly evaluate cell behavior, a trained computational pipeline is needed to correctly identify CTCs, their shape, nuclei, etc, during live cell imaging as well as stained samples. We are recruiting an undergraduate student for the Wong Lab in the School of Engineering to continue a computational project to analyze cell shape and classify heterogeneous phenotypes.

Required qualifications: Past coursework and experience with image processing is needed

Preferred qualifications: High proficiency with computer programming is required (e.g. MATLAB, Python, R), and the position requires a commitment of 10 hours a week

Is this project for more than one student: No

Jimmy Xu
Department: School of Engineering
Project Type: Research
Project Title: Exploratory Research for Compute-in-Memory

Project Description:
Feasibility study of novel semiconductor device structures and circuits for computing in a potentially new paradigm of compute-in-memory. Experimental measurements and theoretical modeling of device functionalities. Design and proof-of-concept demonstration of applications in machine learning, probabilistic computing, and neuromorphic functions.

Required qualifications: Electromagnetism, calculus, some knowledge of semiconductors. Fast learner.

Preferred qualifications: Strong interest in semiconductors and computers, curiosity about how devices and circuits are designed, modeled, made, and measured. Basics of quantum mechanics, coding, and lab techniques. Self-driven. Creative.

Is this project for more than one student: Yes

Kimani Toussaint
Department: School of Engineering
Project Type: Research
Project Title: Exploring Two-Photon Polymerization with AI

Project Description:
Direct laser writing by two-photon polymerization (TPP) has emerged as a revolutionary additive manufacturing technique for micro- and nanofabrication. It utilizes two-photon absorption (TPA) induced in the small focal region of a high-intensity, ultrafast (hundreds of femtosecond-pulse width) laser to initiate bonding of the monomers in the photoresists. The unit volume of polymerization is below the optical diffraction limit, offering TPP high spatial resolution compared to other freeform 3D printing technologies. TPP has been used as a prototyping tool for metamaterials, microfluidic devices, miniaturized optics and tissue scaffolds, among other creative applications. As with other AM processes, the experimental parameters for TPP fabrication are often optimized to ensure the initial design achieves its ideal surface shape. However, more complex microarchitectures such as biomimetic scaffolds have intricate embedded features, yielding the need for visualizing internal patterns of 3D printed parts. Moreover, characterization methods like X-ray and confocal microscopy have been employed, but they are limited by the time-consuming step of washing out unpolymerized photoresists. Defects can arise during the writing process, and the fabricated structure is often not inspected until after it has been developed, usually in a cleanroom. Thus, this overall production cycle limits scalability—in this case, the ability to broadly disseminate the technology—is primarily limited by three factors: 1) the high-cost of the femtosecond optics lasers used to initiate TPA, 2) the domain expertise required to digitize the desired pattern/structures to print, and 3) the lack of sufficient process control to enable high repeatability. The proposed work attempts to solve these outstanding challenges by developing SCalable Advanced Nanoprinting by AI acceleration (SCAN-AI), which incorporates two-step optical absorption using low-intensity lasers, a voice-actuated user-interface for design, and edge computing running a novel algorithm for in situ defect inspection.

The undergraduate student will be involved in experiment design, execution, and analysis. Tasks will include generating and characterization of the nanoprinting process, collecting and analyzing images, using AI to increase throughput of nanofabrication, and making conclusions based on the findings. The student will gain skills in optical design, data analysis, and scientific communication. The student will be encouraged and expected to make author-worthy contributions toward a peer-reviewed publication of this work.

This position will be co-mentored between Professor Kimani Toussaint and Professor Peipei Zhou

Required qualifications: Required qualifications: Python, MATLAB, R, or an equivalent tool for data analysis, Coursework in electromagnetics, optics, and/or related, Self-motivated and curious, A basic understanding of microscopy

Preferred qualifications: Preferred qualifications: Previous experience in an optics lab, ImageJ / FIJI, CAD ,Coachability

Is this project for more than one student: No

Kimani Toussaint
Department: School of Engineering
Project Type: Research
Project Title: Health Technology Sandbox

Project Description:

The future of healthcare is one where an integration of advanced sensors, which can be embedded into the built environment (e.g., home) or worn on the body, combined with artificial intelligence (AI), will lead to on-demand, non-invasive diagnostic assessment of an individual's health. The belief is that such digital health technologies (DHTs) could facilitate the delivery of quality healthcare to anyone, anywhere, and at any time, which has also accelerated the commercialization of DHTs. Furthermore, the landscape for both commercial and research-grade DHTs is extremely broad, ranging from AI-powered mobile apps to emerging advances with neuro-prosthetics to novel wearables that capture multimodal biometric data. Critical to realizing this future, is the cross-disciplinary training of engineers that comprise the next-generation workforce of developers of DHTs for tomorrow's intelligent, smart environments. These engineers will need to develop basic technological literacy in AI hardware and algorithms, a variety of sensor types, wireless communication protocols, and methods from design. Brown University's School of Engineering (SoE) has laid the foundation to train these next-generation of engineers, and is developing the ecosystem to foster the necessary interdisciplinary collaborations that will advance DHTs.

The undergraduate student will be involved in experiment design, execution, and analysis. Tasks will include generating and characterization of data, collecting and analyzing images, using AI to increase throughput, and making conclusions based on the findings. The student will gain skills in coding, programing, data analysis, and scientific communication.

Required qualifications: Programming, coding, electronics, Python, MATLAB, R, or an equivalent tool for data analysis, Self-motivated and curious

Preferred qualifications: • Previous experience in an optics lab
- ImageJ / FIJI
- CAD
- Coachability

Is this project for more than one student: No

Kurt Pennell
Department: School of Engineering
Project Type: Research
Project Title: PFAS Fate and Transport in Unsaturated Soils

Project Description:
The research project will focus on the fate and transport of per and polyfluoroalkyl substances (PFAS) in unsaturated soils. Experiments will be conducted to measure the adsorption of PFAS on soil and their accumulation at air-water interface based on surface tension measurements. Column studies will then be conducted to measure the transport and phase partitioning of PFAS in unsaturated soils. The data collected from the experiments will be simulated using mathematical models that account for unsaturated water flow, multiple adsorption processes, and competitive effects. Experiments and modeling studies will also be conducted to explore the transport of semi-volatile PFAS in the gas-phase.

Required qualifications: wet laboratory experience, EHS lab safety training (can be completed prior to start)

Preferred qualifications: ENGN 490

Is this project for more than one student: No

Kurt Pennell
Department: School of Engineering
Project Type: Research
Project Title: Foam Fractionation to Remove PFAS from Water

Project Description:
This projects focuses on the use of foam fractionation to remove long- and short-chain length per and polyfluoroalkly substances (PFAS) from water, including groundwater and landfill leachate. The work will involve experimental studies using a laboratory-scale foam fractionation system to test non-toxic surfactants that are able to rapidly remove short-chain PFAS. The experimental data will be used to support the development and validation of mathematical models that can be used to simulate PFAS removal by foam fractionation.

Required qualifications: wet laboratory experience, mathematical modeling, EHS lab safety training (can be completed prior to start)

Preferred qualifications: ENGN 490

Is this project for more than one student: No

Lucas Caretta
Department: School of Engineering
Project Type: Research
Project Title: Embedded Insight: Real-Time Lab Infrastructure Monitoring with Raspberry Pi

Project Description:
This semester-long undergraduate research project focuses on developing a real-time equipment and environmental monitoring system for a quantum materials research laboratory. The UTRA researchers will use a Raspberry Pi to build a modular system that continuously tracks the operational status and ambient conditions of key synthesis and characterization tools, including high-vacuum deposition chambers, annealing furnaces, cryogenic systems, and magnetometers.
The project aims to improve lab safety, enable early anomaly detection, and support long-term equipment health. The student will integrate a variety of environmental sensors (e.g., temperature, humidity, pressure, and gas flow) and interface with instrument controllers using communication protocols such as I2C, SPI, and serial. The system will log data in real time and include a network-accessible dashboard for local and remote visualization.
In addition to sensor integration, the student will implement a live video streaming system that allows public viewing of materials deposition inside the lab's quantum materials deposition chambers. This feature will be designed to promote transparency, outreach, and education, enabling viewers to observe the growth of complex oxide films and other advanced materials in real time. The video feed will be

integrated into the same Raspberry Pi platform and synchronized with sensor data where applicable. This project offers hands-on experience in applied computing, hardware-software interfacing, sensor networks, and live streaming technologies, all within the context of a cutting-edge physics research environment. Deliverables include a fully functional prototype, deployment documentation, and a presentation of results to the lab team. This opportunity is ideal for students interested in embedded systems, instrumentation, and the technical infrastructure that supports advanced materials research.

Required qualifications: Introductory experience with Python or another programming language; Interest in programming, electronics, or laboratory instrumentation; Willingness to learn new technical skills and work independently; Strong, attention to detail and problem-solving mindset.

Preferred qualifications: Exposure to Raspberry Pi, Arduino, or similar platforms

Interest in physics, engineering, CS, or materials science research

Experience with version control (e.g., Git) or data visualization tools

Is this project for more than one student: No

Mauro Rodriguez
Department: School of Engineering
Project Type: Research
Project Title: Numerical simulations of acoustic wave-soft tissue interface interaction

Project Description:
In ultrasound imaging of soft tissues (e.g., lungs), bubbles are used to create a higher contrast in the imaging. The small bubble nuclei respond to the ultrasound by inertial growing and increasing contrast in the images. However, the ultrasound grows bubbles that oscillate violently leading to adverse bioeffects (e.g., bleeding) in the soft tissue. The aim of this project is to study the wave-induced vorticity-related mechanisms that lead to adverse bioeffects. The problem of interest involves the following. An acoustic wave travels in a viscoelastic liquid towards a liquid-air interface. The interface is initially perturbed (typically with a sine wave profile) and stationary. The acoustic wave interacts with the interface. The wave is partially transmitted and reflected. The density and pressure gradients from the interaction deposit baroclinic vorticity along the interface. Vorticity distorts the interface and could be a mechanism for the adverse bioeffects. Earlier water-air numerical simulations have enabled the prediction how much the perturbation can grow depending on the initial acoustic wave parameters and interface shape. However, these simulations typically involve a water-air system, water representing the soft tissue. The lung soft tissue has elastic characteristics pertinent to the acoustic wave interface interactions. The student shall use the Multi-Component Flow Code (an open source code) to run numerical simulations of this problem with a viscoelastic solid.

Required qualifications: Strong math and computing skills. Knowledge of Linux is necessary. Student must have knowledge about numerically solving ordinary differential equations. Knowledge about Git repositories would be useful.

Preferred qualifications: Written and ran ODE numerical solvers, knowledge of acoustic and/or shock

waves, some working knowledge of viscoelasticity

Is this project for more than one student: No

Xuning Zhao
Department: School of Engineering
Project Type: Research
Project Title: Using Data Assimilation to Study Bubble Dynamics Near Metal Surfaces

Project Description:
Cavitation—the rapid formation and collapse of vapor bubbles in liquids—plays an important role in surface cleaning, ultrasonic machining, and material erosion. When a bubble collapses near a metal surface, it creates strong pressure and fast fluid motion that can remove contaminants or damage the surface.

In most simulations of this process, researchers assume a bubble starts as a perfect sphere with a known radius, position, and internal pressure. While radius and position can often be measured or controlled, the internal pressure is much harder to measure directly. However, it has a big impact on how the bubble collapses and interacts with nearby surfaces.

This project introduces data assimilation (DA) as a way to improve bubble collapse predictions using limited sensor data. The student will use a method called the Ensemble Kalman Filter (EnKF) to estimate the unknown internal pressure of the bubble based on pressure readings from a few nearby virtual probes. This setup mimics realistic applications, where we may know where the bubble is but not how much energy it has.

The student will start with precomputed 2D simulations of bubble collapse near a rigid metal wall. These simulations will be used to generate synthetic “ground truth” pressure signals. Then, using an open-source DA toolkit called DAFI (Data Assimilation and Field Inversion), the student will build a simple workflow to infer the internal pressure and improve collapse predictions.

This project is ideal for students interested in fluid mechanics, simulation, or applying data science to physics problems. It offers hands-on experience with modern modeling tools and shows how we can use limited data to learn more about complex physical systems.

Required qualifications: Fascination with fluid mechanics and/or bubbles, some knowledge of fundamental fluid mechanics, understanding of how to solve a system of ordinary differential equations (ODEs), some working knowledge of Matlab, C, C++, Python, or similar

Preferred qualifications: Written and ran ODE numerical solvers,
knowledge of acoustic and/or shock waves,
some working knowledge of viscoelasticity

Is this project for more than one student: No

Nora Ayanian
Department: School of Engineering, Computer Science
Project Type: Research
Project Title: Quadrotor dynamic flow sensing under aerodynamic disturbances

Project Description:
Seeking an undergraduate researcher to support a graduate student with integrating a flow sensor onboard a quadrotor for dynamic free-flight experiments. The flow sensor inputs pressure measurements that can be mapped to velocity measurements on proximity interactions. This project will leverage nano-quadrotors to sense airflow and detect those signals for analysis in dynamic close proximity flight.

Required qualifications: Background and experience in embedded programming, embedded systems, and coding in C language

Preferred qualifications: Embedded systems, Programming, Systems engineering, CSCI 1600: Embedded and Real-time software, and ENGN 520: Electrical Circuits and Signals

Is this project for more than one student: Yes

Robin Miller
Department: School of Medicine
Project Type: Course Development
Project Title: NNNS-II (NeoNatal Neurobehavioral Scale) Training Curriculum Development

Project Description:
The NNNS (NeoNatal Neurobehavioral Scale) examines neurobehavioral organization, neurological reflexes, motor development of active and passive tone, and signs of stress and withdrawal of the at-risk and healthy infant. Women and Infants Hospital (WIH) is proud to be using the NNNS not only for research but clinically, as part of hospital guidelines to enhance developmental outcomes of infants at risk. The Brown University, Center for the Study of Children at Risk website can be found here for more details on the assessment: Newborn Assessment (NNNS-II) | Center for the Study of Children at Risk | Medical School | Brown University. Women and Infants' current hospital guidelines include the following populations of infants: those born preterm (all preterm infants <34 weeks and preterm infants 34 0/7-36 6/7 weeks at the request of the infant's provider), have been exposed to opioids in utero (exposure to other substances at the request of the infant's provider), are experiencing neonatal encephalopathy, are having clinical seizure activity, and by consult. We will developing additional online curricula for our online and hybrid training program.

Research assistants will learn about all aspects of the NNNS-II examination and curriculum development for online and hybrid training for the NNNS-II examination. Weekly tasks will primarily include literature searches for appropriate curriculum content, videotaping of NNNS-II examinations, isolating video clips for training curriculum, and creating documents to enhance learning. All students will attend weekly NNNS-II Team meetings with Dr. Miller and Dr. Andreozzi. Students will have the opportunity of hands-on experiences working with high-risk families in the NICU (Neonatal Intensive Care Unit) and MBUs

(Mother/Baby Units) along with Drs. Miller and Andreozzi.

Required qualifications: N/A

Preferred qualifications: Familiarity with Microsoft Word, PowerPoint, Excel. Conducting literature searches.

Is this project for more than one student: No

Patricia Risica
Department: School of Public Health
Project Type: Research
Project Title: Trauma and Eating Behaviors Systematic Review

Project Description:
Trauma is experienced by a many people who proceed through life as survivors. The underlying health effects of trauma are not well understood. One way that trauma affects health outcomes is as a deterrent to healthy behaviors. People identifying as women may be less likely to be screened for breast or cervical cancer, less likely to breastfeed, and more likely to struggle with emotional eating, all of which increase the risk of obesity, cancer, finding cancers later. The students working on this project will conduct a structured review of studies linking trauma with health behaviors among people identifying as women to elucidate the current literature on trauma as an antecedent to poor health behaviors. At this phase in the project, students will participate in abstract and title review, and begin reading papers included in this search.

Required qualifications: Strong organizational skills and ability to work independently.

Preferred qualifications: Experience with literature review and interest in trauma and eating behaviors is a plus.

Is this project for more than one student: No

Patricia Risica
Department: School of Public Health
Project Type: Research
Project Title: Healthy Start - Pilot project to improve dietary intake in childcare and at home.

Project Description:
Health Start is an 8-month intervention for English and Spanish-speaking family childcare providers (FCCP) training them to provide a healthy food and physical activity environment in their childcare home and to deliver messages about healthy eating and active living to parents using an existing childcare App, complemented with environmental cues and tailored print and videos delivered to parents. The student working on this project will work with the study team to recruit participants, conduct surveys, and examine

data of participating family childcare providers, parents and children.

Required qualifications: Spanish language, strong organizational skills, ability to work with a team.

Preferred qualifications: Experience in community research is a plus.

Is this project for more than one student: No

Xan Chacko
Department: Science, Technology and Society
Project Type: Course Development
Project Title: Botanizing Worlds

Project Description:
Plants are crucial to the survival of human life. From the food we eat, to the air we breathe, the clothes we wear, plant bodies are used to build homes, cure our ailments, and feed our addictions. Putting plants to use is tantamount to survival but this course aims for a less extractive relationship with plants. This course explores what we might gain by learning from plants–to know them, think with them, and attune our senses to their liveliness. Raising fundamental questions about human-plant relations to ask; what is mind, where does it extend, and how, and perhaps cause us to reconsider what it means to be human? Pushing back against the ideas of any inherent binary separations between sex/gender and nature/culture, and numerous other binaries that ground western thought, we will examine feminist ecological possibilities for planetary futures.
The role of the student will be collate published multi media materials in the humanistic fields that relate to plants. From video games, horror movies, essays, and graphic novels, plants have been making their presence felt. In addition, at Brown the UTRA will invite collaboration from different sites of botanical interest on campus to establish connections and ideas for practice oriented lessons such as the Brown University Herbarium, the John Hay Library Special Collections, and The Plant Environmental Center on the rooftop of 85 Waterman street. The outcome of the UTRA will be a syllabus and plan for the course offering in Spring 26.

Required qualifications: Experience with reading humanistic texts.

Preferred qualifications: N/A

Is this project for more than one student: Yes

Jenna Morton-Aiken
Department: Sheridan Center for Teaching and Learning/English
Project Type: Research
Project Title: Writing the History of Brown's Writing Fellows Program (1982–2023)

Project Description:

Since its inception in 1982, the Brown University Writing Fellows program has served as an inspiration for peer-mentored writing programs across the United States. This research project, in keeping with the program's mission and values, aims at reviewing and preserving the archival material associated with the program's history.

The Brown Writing Fellows program was founded by Tori Haring-Smith at Brown in 1982. The first of its kind, the program sought to improve both students' and teachers' relationships with academic writing through peer to peer mentorship and student-professor collaboration. "The principles behind the program are simple," Haring-Smith said. "You do not need to have content knowledge in order to be able to help somebody with writing." Writing Fellow alum Tierra Sherlock ('24) shared, "It's about promoting the idea that good writing doesn't mean writing a perfect first draft, it means that any good final draft has to go through rounds of feedback and revision." While Brown's program created the blueprint programs "beyond liberal arts colleges and private universities, taking root in larger public comprehensive and research universities and in community colleges as well," the historical artifacts of the Writing Fellows program has not been reviewed nor has found a final archival home.

This project's purpose is to review the archival materials associated with the Brown Writing Fellows; and create a comprehensive list of documents; and work with the Library to make materials appropriately accessible.Additional tasks would include compiling an index of all past Writing Fellows and associates of the program; creating a collection of past program initiatives; and producing a timeline of the program's history. This project would offer a student the opportunity to engage in archival research with primary documents, and to work towards a possible publication concerning their findings. Through the organization and documentation of the Writing Fellows archive, the program would gain a more comprehensive understanding of its history while making these critical documents accessible to researchers and students on and beyond Brown's campus.

Required qualifications: Completion of ENGL 1190M and at least one semester working as a Writing Fellow.

Preferred qualifications: Demonstrated interest in history, historical writing, archival research, and the Writing Fellows Program. Enthusiasm for working with spreadsheets and Google Drive; ability to ask clarifying questions when confused; and attention to detail in planning, research, and document management.

Is this project for more than one student: No

Carrie Spearin
Department: Sociology
Project Type: Course Development
Project Title: Curricular Redevelopment: The Senior Seminar

Project Description:
Over ten years ago, the Sociology Department was tasked with developing a culminating experience for concentrators. The Senior Seminar (SOC 1950) course challenges students to integrate and demonstrate mastery of the knowledge, skills, and insights gained throughout their Sociology and Social Analysis and Research coursework. This project will assess the impact of the Senior Seminar and its effectiveness in

meeting the curricular goals of the concentrations. Additionally, the student will work on redesigning the capstone experience.

This project is ideal for students interested in concentrating in Sociology, Social Data Analytics, or the Social Sciences, especially those who enjoy thinking about curriculum development in higher education and creating learning opportunities for undergraduate students. As part of this project, the student will: (1) investigate the purpose of a capstone experience at Brown University; (2) collect information about capstone experiences at other peer institutions; (3) gather information about capstone experiences from other social science concentrations at Brown; (4) analyze data from past students regarding their experiences in the Senior Seminar; and (5) work on redesigning the senior capstone experience to strengthen the curriculum of the Sociology and Social Analysis and Research concentrations.

Required qualifications: N/A

Preferred qualifications: Concentration in Sociology or Social Analysis and Research (SAR) or a strong interest in the social sciences or higher education.

Is this project for more than one student: No

Carrie Spearin
Department: Sociology
Project Type: Research
Project Title: Program Evaluation: Promoting a diverse & competitive research workforce

Project Description:
A growing body of research indicates the importance of providing disadvantaged undergraduate students with research mentoring opportunities. These opportunities increase the research pipeline and provide the essential skills needed in an ever-complex, competitive job market outside academia. This SPRINT research project will focus on assessing several STEM research-to-career pathway programs. The student will work closely with the faculty members to contribute to an ever-growing knowledge base and help strengthen the rationale for future programmatic decision-making.

This project is ideal for students interested in concentrating in Sociology, Social Data Analytics, or Education, especially those interested in broadening access to resources and opportunities. The student researcher will conduct literature reviews, perform simple data analysis (using SPSS - not a required skill), build survey instruments in Qualtrics, write research briefs, and develop data visualizations for professional presentations.

Required qualifications: N/A

Preferred qualifications: SPSS or STATA, Qualtrics, Excel and Powerpoint; Strong organizational communication skills

Is this project for more than one student: No

John Logan
Department: Sociology
Project Type: Research
Project Title: Mapping segregation and neighborhood inequality

Project Description:
This is a set of related projects using historical data and GIS maps for 1880-1980 to study issues of segregation and inequality across neighborhoods in U.S. Cities. The UTRA student will join a team of undergraduate RAs who have been working on various aspects of this research for several years, especially to develop the historical street and census block maps that allow us to define the neighborhoods where people lived. One project will look across the whole century to document the trajectory of segregation of Blacks and Hispanics from whites across neighborhoods, between cities and suburbs, and within suburbia. Another focuses on redlining and discrimination in mortgage availability in the 1930s and beyond, documenting which neighborhoods were underserved and how that affected their development. Another analyzes deaths from the Spanish flu in 1917-1918 in Philadelphia and New York, identifying which people and which neighborhoods were most vulnerable to that pandemic.

Required qualifications: We will train students who can work carefully, regardless of prior skills.

Preferred qualifications: Students from different backgrounds have worked successfully on this project. Some background or interest in urban issues, urban history, racial segregation and neighborhood inequality would be of value. Some GIS or computing background would be a plus.

Is this project for more than one student: Yes

Nicole Gonzalez Van Cleve
Department: Sociology
Project Type: Research
Project Title: Race and Wrongful Conviction in the U.S.

Project Description:
Wrongful conviction is defined by racial disparity. However, we know little about how racial stigma creates egregious miscarriages of justice. This study offers a novel intervention in the field of wrongful convictions by examining how racial stigma embeds in the seemingly race-blind, fact-finding stage of criminal investigations. Specifically, I focus on false confessions because they are the most common type of evidence used in serious cases like murder but also because they are important indicators of how police and prosecutors craft criminal cases with “contaminating narratives” used to incite racial animus with juries. I rely on data from the National Registry of Exonerations and from the Center for Science and Justice at Duke University. Many of the exonerees have experience retaliation from police after they are found not guilty or their convictions are reversed.

Students work with university librarians to pull media coverage of these high-profile wrongful conviction case. This semester we will shift focus to the lives of exonerees after they are free. Students will examine how racial tropes are used in confessions and amplified in the media. They will also research

key court decisions related to legal protections afford to juvenile suspects in criminal cases.

Required qualifications: Social Science RESEARCH METHODS class in the sociology or related field. Coursework in the area of race/racism and ethnicity or Black Studies.

Preferred qualifications: Familiarity with navigating university libraries and archives.

Is this project for more than one student: No

Han Zhang
Department: Sociology/Watson School for International and Public Affairs
Project Type: Course Development
Project Title: Bridging the Technical Gap: Empowering Social Scientists in the AI Age

Project Description:
In an era of rapidly evolving AI technologies and unprecedented data availability, social scientists face mounting challenges in developing computational fluency. SOC 2961M: Computational Methods for Social Scientists. aims to prepare students to engage critically and creatively with data-driven research, but the course currently encounters several barriers: students come from diverse disciplinary backgrounds, many lack Python proficiency despite experience with software like Stata, and the rapid proliferation of tools such as open-source LLMs and APIs like OpenAI's pose integration and accessibility challenges.

This course development proposal focuses on three enhancements. First, we will design beginner-friendly Python training modules tailored for students with prior data experience in platforms like Stata or SPSS, helping them transition into Python-based workflows. Second, we will curate and develop resources for working with new open-source AI models, including practical tutorials on high-performance computing (HPC) environments, terminal operations, and API-based querying—skills critical for modern research but often inaccessible due to their technical complexity. Third, we will build in mechanisms to update course content responsively, enabling modules to reflect the capabilities and limitations of emerging models like Claude, LLaMA, or GPT variants.

Deliverables will include a modular website housing video tutorials, step-by-step code walkthroughs, and centralized documentation for tools introduced in the course. The project will also create reusable Jupyter notebooks and terminal guides designed for pedagogical clarity. This development will not only improve access and equity within SOC 2961M, but also serve as a scalable template for integrating AI tools into social science pedagogy.

Required qualifications: - required skills: knowledge in Python and basic machine learning operations.

Preferred qualifications: - preferred skills: have taken courses in quantitative social sciences and are interested in social science research using big data and machine learning.

Is this project for more than one student: No

Han Zhang
Department: Sociology/Watson School for International and Public Affairs
Project Type: Research
Project Title: Using Generative AI to Create Visual and Audio Stimuli for Survey Experiment Research in Social Sciences

Project Description:
Survey experiments in the social sciences have long relied on text as the primary format for delivering treatments. Yet decades of research in psychology and cognitive science demonstrate that images and audio engage distinct mental processes—often more effectively than text—by capturing attention, conveying emotion, and increasing ecological validity. Despite this, most experiments still use only text due to practical constraints: generating high-quality, standardized non-text stimuli has traditionally required specialized skills and significant time or funding.

This project explores how generative AI tools—such as text-to-image or text-to-speech models—can be harnessed to overcome these barriers and expand the methodological toolkit for social scientists. The goal is to evaluate whether AI can help researchers create controlled, interpretable, and impactful visual/audio treatments that complement or enhance traditional text-based designs.

Working under faculty guidance, the student researcher will help develop a repository of current generative AI tools suited for social science use, assess their strengths and limitations through small pilot tasks, and contribute to building sample stimuli and tutorials for future research use. Special attention will be paid to biases, realism, and confounding risks introduced by AI-generated media.

Note that this research is about experiment design: how to better design treatment stimulus to be given to respondents. We do not have plans to execute a survey experiment and thus do not need IRB approval at this stage.

Required qualifications: Passinate about new developments of AI tools, especially related to AI generation of images or audios models. Have take social science research design classes and have exposure to causal inference.

Preferred qualifications: Knowledge of Python programming is a bonus.

Is this project for more than one student: No

John Eason
Department: Sociology/Watson School for International and Public Affairs
Project Type: Research
Project Title: Punishment Beyond Mass Incarceration: Immigrant Detention, Jails, and Prison

Project Description:
We have three central projects to reframe the national narrative surrounding prison abolition to focus on policy solutions targeting health/wealth initiatives in rural communities of color. These criminal legal

system policy reforms will be focused on how to best repurpose prisons, jails, and immigrant detention centers once these facilities are shuttered. We are looking for two-three research assistants: one to help with quantitative data analysis and one to assist with qualitative data analysis for our studies. Students will contribute to data analyses and strengthen skills such as coding, cleaning of data, interviewing, and memo writing. They will also have space to discuss their interpretations of the findings with the PI and will have a chance to guide the study towards new research questions.

For the Prison Bust Project, one central question of our investigation asks: how do prison closures directly and indirectly impact local prison town communities? How can impacted stakeholders and communities be involved in the creation of viable, safe, and ethical policies (and practices) for closing prisons in ways that mitigate potential or unintended harms?

Another project we have is Health, Violence, in Immigrant Detention which seeks to understand how race and punishment intersect to produce health disparities in immigrant detention centers.

Lastly, we have an emerging project called the Jail Justice Initiative where we are mapping the growth of the jail population and location of facilities over the last 50 years.

Required qualifications: Interest and passion around the criminal legal system.

Preferred qualifications: Quantitative research assistants preferred skills:
-Experience working with quantitative data analysis tools such as STATA or commitment to learning
-Experience working with spatial analysis tools such as ArcGIS or commitment to learning
-Interest in the US prison system, inequality, and sociological research

Qualitative research assistants preferred skills:
-Experience working with qualitative data analysis tools such as MAXQDA or commitment to learning
-Experience or interest in conducting qualitative research interviews
-Interest in the US prison system, inequality, and sociological research

Is this project for more than one student: Yes

Lindsay Clark Donat
Department: Surgery
Project Type: Research
Project Title: HPV Occupational Exposure: Vaccination Awareness and Acceptance Among Healthcare Trainees

Project Description:
Human Papillomavirus (HPV) infection is the most common sexually transmitted infection in the United States and the leading cause of reproductive and oropharyngeal cancers. HPV infection can also lead to significant psychosocial distress, including anxiety, depressive symptoms, and sexual dysfunction. Healthcare workers are at increased risk for HPV contraction due to occupational hazards associated with treatment of HPV-related lesions, leading multiple professional medical associations to recommend vaccination. Despite these risks and recommendations, both awareness of increased occupational risk and vaccination rates remain low among medical providers.

HPV vaccination is generally considered safe and effective among medical professionals, and the HPV vaccine is widely available. Healthcare students may be a valuable target for public health campaigns aimed at increasing HPV vaccine uptake, but there is a lack of research aimed at understanding the unique needs of this population. This project will recruit a sample of medical and physician assistant students from local training programs for a mixed-methods study aimed at understanding 1) awareness of risks associated with occupational HPV exposure, 2) familiarity with and attitudes toward HPV vaccination and recommendations, and 3) students' perceptions of their institution's role in providing HPV vaccination. This project is under IRB review.
The research assistant will receive training in research ethics and quantitative and qualitative methods. They will assist with 1) recruitment and enrollment, 2) managing the project database, and 3) qualitative methods (interview transcription, analysis). Based on level of experience, there may be opportunity to conduct interviews.
This project is a necessary first step in the development of a health promotion campaign aimed at improving occupational safety among healthcare providers. The data obtained here will serve as pilot data in the preparation of a larger grant aimed at first exploring HPV vaccination in medical training programs nationwide, then at public health initiative to reduce HPV-related risks in this population. The research assistant will have the opportunity to help prepare presentations, manuscripts, and grant applications, based on availability.

Required qualifications: Strong interpersonal skills, comfort in discussing reproductive health and vaccination among local students, ability to be present in Providence for recruitment purposes. Applicants must also demonstrate interest in medicine and/or public health.

Preferred qualifications: N/A

Is this project for more than one student: Yes

Andrew Ryan
Department: The Center for Advancing Health Policy through Research, Health Services, Policy & Practice, School of Public Health
Project Type: Research
Project Title: Improving Value in U.S. Health Care Spending

Project Description:
The Center for Advancing Health Policy through Research (CAHPR) at the School of Public Health conducts research to better understand and develop policies that will lower spending growth, improve patient outcomes, and drive structural change in U.S. health care delivery. Core topic areas include payment reform, the evolving landscape of Medicare and Medicare Advantage, commercial price growth, health care market structures including the impacts of consolidation and private equity ownership, and state efforts to address affordability and value. Examples of current projects are: Evaluating the Design of State Efforts to Reduce Health Care Prices, Understanding the Impact of Payer-Provider Integration in Medicare Advantage, Policy Options to Advance Universal Health Care in Rhode Island, Using Transparency in Coverage Data to Understand Health Care Price Variation, and The Physician Practice Ecosystem over the Private Equity Life Cycle.

CAHPR seeks two (2) undergraduate Research Assistants (RAs) to contribute to the center's work. One

position will have a policy focus and is ideal for students with interest and prior coursework in health law, health policy, and related fields. Examples of the role's activities are: literature reviews, policy research, qualitative data collection, manual data extraction, and writing. The other position will have a quantitative focus and is ideal for students with interest and prior coursework in economics, data analysis and programming, and health services research. Examples of the role's activities are: coding, statistical computing, econometric methods, and data visualization. Both positions will work collaboratively with faculty-led teams in a dynamic environment that encourages independent thinking, problem solving, and collegiality.

Required qualifications: For the role with a policy focus, prior coursework in one or more of the following is required: PHP 310 - Health Care in the U.S.; PHP 330 - Health Law & Policy; PHP 1460 - Public Health Law & Policy. For the role with a quantitative focus, some programming experience and working knowledge of R, Stata, SAS, Python, Tableau, SQL or comparable language is required.

Preferred qualifications: N/A

Is this project for more than one student: Yes

Becci Davis
Department: Visual Art
Project Type: Research
Project Title: Unpolished Legacies Online

Project Description:
Unpolished Legacies Online is a digital resource for middle and high school education that uses art to explore Rhode Island's cultural and natural histories. This project supports instruction on local Indigenous, botanical, industrial, and post-industrial heritage using Mashapaug Pond, as a focal point and springboard for study. By centering the work of local artists who engage in advocacy and activism through their artistic practice, Unpolished Legacies Online enables students and teachers to realize the role that the arts can take in raising awareness of contemporary issues, exploring historical content from multiple perspectives, and deepening critical thinking and discussion.

The intention of this website is to share different perspectives on the impact of the Gorham Silver Manufacturing Company brought together by the Unpolished Legacies project (2019) to support place-based instruction for science, social studies and art. The original project consisted of a series of collaborative interventions in response to the RISD Museum's 2019 exhibit, Gorham Silver, Designing Brilliance, 1850-1970, which included the production of a zine, a pop-up exhibition featuring twelve local artists, a blog, two community conversation panels, and an evening of performances. At this stage of development, we are editing resources to complete the website, and preparing for its launch in Spring 2026. You can view several of our contributor feature pages here. We are looking for an UTRA research assistant to support content editing and graphic design for our final additions to the site. This team member will assist in designing lesson plan downloadables and will interface with local educators contributing to the project in developing additional curriculum support for the website. They will also research contributing artists and create social media promotional materials, such as artist profile posts. Thank you for your consideration and please feel free to reach out to us if you have any questions.

Required qualifications: Interest in visual arts, public art and/or history, strong design skills, proficiency in Adobe Photoshop, Adobe InDesign, and/or Canva, willingness to read background material related to the website content to approach design with an informed lens, curiosity in art as a catalyst for change, ability to work independently and meet deadlines

Preferred qualifications: Art history, public humanities, or education courses, experience in graphic design, interest or experience in education and/or curriculum development

Is this project for more than one student: No

David Polatty
Department: Watson Institute for International and Public Affairs
Project Type: Course Development
Project Title: Human Security Simulation Development

Project Description:
Students will support the development of new simulations for IAPA courses, as well as improve existing simulations for IAPA 0310 and IAPA 1804M. These simulations are designed to put students into key decision making roles dealing with global crises, including hurricane response, pandemic response, climate change adaptation, and maritime security (as examples). Students will help develop and test these simulations which will be taught during the Spring 2026 semester.

Required qualifications: Critical thinking skills and a strong interest in human security, humanitarian, or climate work.

Preferred qualifications: Students who have taken a prior course from me or other faculty who fun simulations in their courses will be an optimal fit. This course/simulation development effort is ideally suited for a 2-student team.

Is this project for more than one student: Yes

Tyler Jost
Department: Watson Institute for International and Public Affairs
Project Type: Research
Project Title: Major Power Cooperation in the Modern Era

Project Description:
When do major powers cooperate? How did the Cold War between the United States and the Soviet Union begin? How did the competition between the United States and the People's Republic of China come about? This projects is an opportunity to work on a project with Professor Tyler Jost documenting the evolution of cooperation between major powers (United States, China, Soviet Union/Russia, France, United Kingdom, Germany, Japan) since the mid-twentieth century. Research assistants on the team will review transcripts of high-level diplomatic meetings between heads of state and foreign ministers – and

be responsible for writing summaries of the types of cooperative agreements reached during these engagements. Transcripts have been collected from various archives around the world.

Required qualifications: N/A

Preferred qualifications: Professional fluency in French, German, Russian, Chinese, and Japanese may be helpful but is not mandatory.

Is this project for more than one student: Yes

Ieva Jusionyte
Department: Watson Institute for International and Public Affairs, Anthropology Department
Project Type: Research
Project Title: Extraditions: Can Justice Be Exported?

Project Description:
This research project is part of a larger study on extraditions from Latin America to the United States. In the past four decades, the U.S. government has requested the extradition of thousands of foreign nationals from Colombia, Mexico, Honduras, Panama and other Latin American countries to be prosecuted in the United States. Although some of them are known organized crime leaders, the majority are less important figures. All of them, however, are only charged with crimes that matter to the United States, primarily drug trafficking and money laundering conspiracies as well as homicide involving U.S. citizens. According to preliminary analysis of the data on extradition cases, acts of violence and human rights violations abroad almost never come up in criminal prosecutions in the U.S. If they plead guilty and agree to cooperate with U.S. prosecutors, extradited individuals receive reduced sentences and can start new lives in U.S. witness protection program. Meanwhile, the crimes they committed abroad - extortion, kidnapping, disappearance, and murder in Mexico, Colombia, Honduras, and elsewhere – remain unsolved, obstructing justice and the search for truth. Extradition is a form of outsourcing justice that comes with profound implications for Latin America, worsening already deep distrust that citizens have towards their governments and national criminal justice systems. Although legal scholars have analyzed certain dilemmas that extradition presents, such as disparities in punishment (unlike most of Latin America, the U.S. practices death penalty), little is known about extradition's broader social effects. This study seeks to collect, systematize, and analyze data on extraditions from Latin America to the United States since the 1970s. Student researchers will be working on creating a database of extradition cases (drawing on press releases, media coverage, and other open sources), and doing a comparative analysis of extradition treaties between the U.S. and Latin American countries (noting treaty provisions and exceptions).

Required qualifications: Proficient in using spreadsheets to organize large qualitative data sets, detail oriented, fluent in Spanish

Preferred qualifications: Interested in working with legal documents; prior coursework in Latin American studies

Is this project for more than one student: Yes