BROWN

Summer 2026 Faculty Opportunities Sorted by Department or Program

Please see below for full position descriptions hyperlinked in the position title. Note that projects with multiple faculty mentors will appear multiple times in the table of contents.

SPRINT UTRA applications are due by February 2nd, 2026 at 12:00 PM EDT (noon).

Department/Program Name	***Faculty Name***	***Project Title***
Africana Studies	Patsy Lewis	In the Wake of George Floyd: Engaged Scholarship course
Africana Studies	Patsy Lewis	In the Wake: Documenting Impact of Federal Government Policies on Rhode Island's Marginalized Communities [This https://docs.google.com/document/d/1CUQ9yVJocgbsfDTxKAZqwegN4hRpS0x-zE--nD4qvP4/edit?tab=t.0project is cross-listed with the Brown Laidlaw Scholars Program.]
Africana Studies, History	Keisha Blain	Black Thinkers: The Global Impact of Black Intellectual Thought
Africana Studies, History	Keisha Blain	Black transnationalism
American Studies	Jessica Fremland	Into the Depths of Inclusion: Cultural Safety, Care Networks, and Resources for Indigenous Artists, Storytellers, and Creatives [This project is cross-listed with the Brown Laidlaw Scholars Program.]
American Studies	Jessica Fremland	Storying Escape: Native American Boarding School Histories on Screen
American Studies, Annenberg Institute, Sociology, Population Studies and Training Center	Kevin Escudero	"Education, Not Deportation": Immigrant Graduate and Professional Students'

		Educational Trajectories
American Studies, History	Evelyn Hu-DeHart	Developing new modules for bilingual (Spanish-English)First-Year Seminar on the US-Mexico Border
American Studies, Sociology	Elena Shih	Operation Restore Roosevelt and Policing Asian Massage Work in New York City [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Anthropology, Data Science Institute, Institute at Brown for Environment and Society (IBES), Science, Technology, and Society	Kim Fernandes	Measuring Disability Globally: Similarities and Differences Across Contexts
Anthropology, Linguistics	Paja Faudree	"The Meanings of Merit: Labor, Categories of Difference, and the Creation of Knowledge"
Anthropology, Literary Arts	Paja Faudree	Xolotl: Stories and Poems from MexiMerica
Behavioral and Social Sciences	Matthew Meisel	ASCEND: A Study of Career Entry and Network Development
Behavioral and Social Sciences	Cara Murphy	Clinical Research Evaluating Smoking Cessation with E-Cigarettes, and Nicotine Therapy (CRESCENT) Study
Behavioral and Social Sciences	Alexander Sokolovsky	Daily Remote Ecological Assessment of Cannabis and Sleep (DREAMS)
Behavioral and Social Sciences	Jennifer Sacheck	Fueling Health: Nutrition & Movement for Disease Prevention - Incorporating Student Interests & Perspectives
Behavioral and Social Sciences	David Zelaya	Revisiting & revising course by centering community engagement- Introduction to Health Disparities: Making the

		Connection Between Structure, Social Determinants & Health Equity (PHP 400)
Behavioral and Social Sciences	Tayla von Ash	Rhode Island Teen Institute [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Behavioral and Social Sciences	Tayla von Ash	Sleep promotion in young children
Behavioral and Social Sciences	Elizabeth Aston	The Behavioral Economic Study of MicroTransitions
Behavioral and Social Sciences	Shufang Sun	Thriving in a Digital World: A Mindfulness-Based Intervention for Healthy Smartphone Use in Adolescents [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Behavioral and Social Sciences, Epidemiology	Shufang Sun	Promoting the mental health of Ukrainian youth and family [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Biostatistics	Christopher Schmid	A Methods Scoping Review to Record All Statistical Approaches for Transforming Effect Sizes in Meta-Analysis (and Building an R package)
Biostatistics	Roee Gutman	Designing Statistical Software for Matching Algorithms
Biostatistics, Center for Computational Molecular Biology	Ying Ma	Integrated Spatial Multi-Omics and Multi-Slice Analysis for Reconstructing Tissue Architecture
Biostatistics, Data Science Institute	Roee Gutman	Designing Statistical Software for Secondary Data Analysis of Linked Datasets
Brown Arts Institute, Theatre Arts and Performance Studies	Sydney Skybetter	Choreographic Analysis of Space Colonialism and Resistance

Brown Arts Institute, Theatre Arts and Performance Studies	Sydney Skybetter	Course Development for "How to Punch Space Nazis in Zero-G: Choreographies of Resistance in the Interstellar"
Center for Alcohol and Addiction Studies, School of Public Health, Behavioral and Social Sciences	Jane Metrik	Cannabis Use and Driving in Daily Life (the CAR Study) [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Center for Alcohol and Addiction Studies, School of Public Health, Behavioral and Social Sciences	Jane Metrik	Cannabis' Impact on Alcohol Consumption (Project MARS) [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Chemistry, Data Science Institute, Molecular Biology, Cell Biology, and Biochemistry, Physics	Brenda Rubenstein	Quantum Computing Biology and Catalysis
Chemistry, Data Science Institute, Molecular Biology, Cell Biology, and Biochemistry, Physics	Brenda Rubenstein	Recontextualizing Science
Chemistry, Engineering	Megan Kizer	Bioconjugation of Tumor-Targeting Glycan Binding Proteins for Improved Cancer Therapeutics
Chemistry, Engineering	Benjamin McDonald	Colloidal Liquid Crystalline Polymers Towards Hierarchically-Structurable Soft Materials
Chemistry, Engineering	Benjamin McDonald	High Throughput Discovery of Tissue-Like Soft Materials
Chemistry, Engineering, Molecular Biology, Cell Biology, and Biochemistry	Megan Kizer	Generation of Diverse Glycan Binding Protein Libraries and their Directed Evolution
Classics, John Nicholas Brown Center for Advanced Study	Johanna Hanink	Brown's earliest curriculum: a thick description
Cognitive and Psychological Sciences	Ruth Colwill	Assessing behavioral disturbances in development

Cognitive and Psychological Sciences	Julia Marshall	How do children think and learn about morality?
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	Ruth Colwill	Improving the effectiveness of teaching observation programs
Cognitive and Psychological Sciences	David Sobel	Parent-Child Interaction and Children's STEM engagement in the Wild [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Cognitive and Psychological Sciences	David Levari	Programming and web development (make games for behavioral science!)
Cognitive and Psychological Sciences	David Levari	The Psychology of Social Judgment, Performance Evaluation, and Error Detection with Human and AI Partners
Cognitive and Psychological Sciences	Joo-Hyun Song	Tracking cognitive effort using pupilometry
Cognitive and Psychological Sciences	Joo-Hyun Song	Tracking cognitive effort with EEG and pupillometry in perception-action coupling tasks.
Cognitive and Psychological Sciences, Carney Institute for Brain Science	David Badre	How does brain stimulation affect cognitive control processes?
Cognitive and Psychological Sciences, Carney Institute for Brain Science	David Badre	How does multitasking training affect neural representations?
Cognitive and Psychological Sciences, Linguistics	Roman Feiman	How do children learn to speak and think?
Computer Science	Ugur Cetintemel	AI-Augmented Database

		Systems
Computer Science	Stefanie Tellex	End-to-end Neural Models for Autonomous Drone Flight
Computer Science	Akshay Narayan	Extensible Operating Systems
Computer Science	Ugur Cetintemel	Impact Afghanistan 2.0 [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Computer Science	Milda Zizyte	Model Checking for Cyber-Physical Systems
Computer Science	Tim Nelson	Model Checking for Cyber-Physical Systems
Computer Science	Srinath Sridhar	Multi-Camera Capture System for 3D Artificial Intelligence - BRown Interaction Capture System (BRICS)
Computer Science	Shriram Krishnamurthi	New Solvers for Forge
Computer Science	Tim Nelson	New Solvers for Forge
Computer Science	Deepti Raghavan	Serving and Training Compound AI Applications
Computer Science	Stefanie Tellex	Twitch Plays Spot: Virtual Reality Teleoperation for Human-Robot Teams
Computer Science	James Tompkin	Virtual Reality Teleoperation of Spot Robots
Data Science Institute	Tomo Lazovich	Mapping AI use and impacts in public benefits programs
Dermatology	Eunyoung Cho	Epigenetics and psoriasis
Dermatology	Eunyoung Cho	Pilot trial of supplemental Vitamin A and nicotinamide in solid organ transplant recipients
Earth, Environmental and Planetary Sciences	Christopher Horvat	Bespoke AI tools for extreme weather downscaling and forecasting

Earth, Environmental and Planetary Sciences	Colleen Dalton	Imaging magma distribution under volcanoes using seismic waves
Earth, Environmental and Planetary Sciences	John Mustard	Inferring Martian paleoshorelines from crater degradation signatures
Earth, Environmental and Planetary Sciences	Shailja Gangrade	Investigating Physical and Ecological Controls on Phytoplankton Communities
Earth, Environmental and Planetary Sciences	Andrea Rajsic	Lunar Science & Public Engagement [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Earth, Environmental and Planetary Sciences	John Mustard	Mars Sample Return
Earth, Environmental and Planetary Sciences	Yongsong Huang	Novel applications of UPLC-Orbitrap mass spectrometer (Exploris 240) in climate and biomedical research
Earth, Environmental and Planetary Sciences	Yongsong Huang	Novel molecular tools to quantify past sea ice changes in the Arctic ocean
Earth, Environmental and Planetary Sciences	Christopher Horvat	Quantifying Sea Ice Geometries from Space
Earth, Environmental and Planetary Sciences	Alkaterini Tavri	Storm-driven Antarctic sea ice drift from synthetic aperture radar imagery
Earth, Environmental and Planetary Sciences, Applied Mathematics	Mara Freilich	Community Science for Environmental Justice [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Earth, Environmental and Planetary Sciences, Applied Mathematics	Mara Freilich	Exploring the Fate of Organic Carbon in the Gulf of Guinea
Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and	Meredith Hastings	Breathe Providence: Interdisciplinary Studies of Air Pollution [This project is

Society (IBES)		cross-listed with the Brown Laidlaw Scholars Program.]
Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)	Seda Salap-Ayca	Climate Risk Uncertainty Visualization for Pacific Island Countries and Territories [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)	Seda Salap-Ayca	Human-Centered Metrics for Land Conservation Planning [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)	Timothy Herbert	The North Atlantic: engine of climate change
East Asian Studies	Heeyeong Jung	Speech style shifts occurring during cooking club activities among non-native and native speakers of Korean
East Asian Studies	Hye-Sook Wang	Story of Koreans
East Asian Studies	Trang Tran	Vietnamese Quest III: Rise of the New Companions - An Expanded Gamified Adventure for VIET 300
Ecology, Evolution & Organismal Biology	Elizabeth Brainerd	Biomechanics of Heron Feeding Strikes
Ecology, Evolution & Organismal Biology	Daniel Weinreich	Evolution of Biological Noise
Ecology, Evolution & Organismal Biology	Jessica Tingle	Evolution of snake musculoskeletal anatomy and function
Ecology, Evolution & Organismal Biology	Rebecca Kartzinel	Tracking Rhode Island's Rare Plants [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Ecology, Evolution & Organismal	Jessica Tingle	Video analysis of snakes moving

Biology		on different surfaces
Ecology, Evolution & Organismal Biology, Institute at Brown for Environment and Society (IBES)	Tyler Kartzinel	Wildlife ecology in Yellowstone National Park [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Economics	Anna Aizer	Undergraduate Research Fellows for Social Science and Public Policy
Education, Annenberg Institute	Christopher Cleveland	Undergraduate Research Fellows for Social Science and Public Policy
Education, Economics	Matthew Kraft	How can schools become more resilient to climate change and contribute to solutions?
Education, Economics	Matthew Kraft	What are the effects of paying K-12 teachers more money?
Education, History	Tracy Steffes	Education Inc: For Profit Businesses in the History of American Education
Egyptology and Assyriology	Jonathan Russell	Comparative Materiality of Ancient Egyptian and Mesopotamian Medical Recipes
Emergency Medicine, Institute at Brown for Environment and Society (IBES), Medical Science	Kyle Denison Martin	Trauma Training Sessions at District Hospitals in Rwanda
Emergency Medicine, Institute at Brown for Environment and Society (IBES), Medicine	Kyle Denison Martin	Creation of Patient Discharge Instructions on Extreme Weather & Environmental Exposures
Emergency Medicine, Pediatrics	Alicia Gensica	Assessing the Impact of Fluid Administration on Sepsis Severity Among Pediatric Patients in Dhaka, Bangladesh
Emergency Medicine, Pediatrics	Alicia Genisca	Effect of Gastrointestinal Treatment of Ebola Virus Disease
Engineering	John Simeral	Decoding and signal analysis for intracortical BCIs

Engineering	Kimani Toussaint	Exploring Two-Photon Polymerization with AI
Engineering	Kimani Toussaint	Health Technology Sandbox
Engineering	Rick Fleeter	Living the Good Life - In Space
Engineering	Mauro Rodriguez	Numerical simulations of acoustic wave-soft tissue interface interaction
Engineering	Kurt Pennell	Synthesis of Novel Biochars to Mitigate PFAS Uptake and Leaching
Engineering	Daniel Watkins	Understanding the seasonal cycle of Arctic sea ice
Engineering, Carney Institute for Brain Science	John Simeral	Software core for a high-performance embedded BCI
Engineering, Carney Institute for Brain Science, VA Center for Neurorestoration and Neurotechnology	Leigh Hochberg	Decoding and signal analysis for intracortical BCIs
Engineering, Ecology, Evolution & Organismal Biology	Kenny Breuer	Blowing (and Bending) in the Wind - flexible Structures in Nature and Engineering
Engineering, Ecology, Evolution & Organismal Biology	Kenny Breuer	Dynamics of Offshore Wind Turbines
Engineering, Institute for Biology and Medicine (I-BEAM), Molecular Biology, Cell Biology, and Biochemistry	Theresa Raimondo	Replicating Senolytic CARs with mRNA
Engineering, Medical Science	Kareen Coulombe	Engineering Microvascular Networks for Regenerating the Heart
Engineering, Pathology and Laboratory Medicine	Ian Wong	Profiling Circulating Tumor Cell Heterogeneity using Computer Vision and Machine Learning
Epidemiology, Pandemic Center	Diane Meyer	Tracking and contextualizing infectious disease epidemiologic data to improve public

		accessibility
Health Services, Policy & Practice	Emmanuelle Belanger	A Palliative Care Quality Improvement Project in Partnership with a Large, Non-Profit Provider [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Health Services, Policy & Practice	Maricruz Rivera-Hernandez	Access to Care and Outcomes for Older Adults with Dementia After Migration
Health Services, Policy & Practice	Amal Trivedi	Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems
Health Services, Policy & Practice	Cyrus Kosar	Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems
Health Services, Policy & Practice	David Meyers	Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems
Health Services, Policy & Practice	Emily Gadbois	Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems
Health Services, Policy & Practice	Emma Belanger	Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems
Health Services, Policy & Practice	Momotazur Rahman	Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems
Health Services, Policy & Practice	Emmanuelle Belanger	Determining Ownership of Hospice Agencies by Medicare Advantage Organizations
Health Services, Policy & Practice	Brendan Saloner	Evaluating a Novel Approach to Dispensing Methadone for

		Opioid Use Disorder in Carceral Facilities
Health Services, Policy & Practice	Melissa Clark	Evaluating The Effectiveness Of Mode Of Meal Delivery On The Ability Of Homebound Older Adults To Remain In The Community [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Health Services, Policy & Practice	Michael Barnett	Health Care Access and Quality
Health Services, Policy & Practice	Olivier Wouters	Health toll associated with delayed access to essential medicines in 90 countries, 1982-2025
Health Services, Policy & Practice	Maricruz Rivera-Hernandez	Heat Exposure and Healthcare Needs of Older Adults in Puerto Rico
Health Services, Policy & Practice	Irene Papanicolas	How long till a drug is safe? Using Real World Data to generate evidence for prescribing in clinical practice
Health Services, Policy & Practice	Andrew Ryan	Improving Value in U.S. Health Care Spending - Policy Focus
Health Services, Policy & Practice	Andrew Ryan	Improving Value in U.S. Health Care Spending - Quantitative Focus
Health Services, Policy & Practice	Lindsey Murtagh	Law and Health Policy Research
Health Services, Policy & Practice	Brendan Saloner	The Effects of Zero Cost-Sharing on Mental Health Services Outcomes – a Qualitative Study
Health Services, Policy & Practice, Data Science Institute	Areti- Angeliki Veroniki	A Methods Scoping Review to Record All Statistical Approaches for Transforming Effect Sizes in Meta-Analysis (and Building an R package)

Health Services, Policy & Practice, Epidemiology	Theresa Shireman	Heat and Healthy Aging: Community Partner Engagement [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Health Services, Policy & Practice, Epidemiology	Theresa Shireman	The effects of extreme heat on older adults
Health Services, Policy & Practice, Pandemic Center	Wilmot James	Research on approaches countries can undertake to strengthen non-proliferation measures, preparedness, early detection and warning biosurveillance and response to natural outbreaks, accidents, and deliberate biological events in rural and agricultural areas in Africa.
History	Robert Self	Comfort and the American Middle Class, 1945-2000
History	Michael Vorenberg	Fortress of Servitude
History and East Asian Studies	Cynthia Brokaw	Summer School on the Theme of "Ritual"
History of Art and Architecture	Lindsay Caplan	Global History of Art and Architecture
History, Cogut Institute for the Humanities, Data Science Institute	Holly Case	Summer School on the Theme of "Play"
History, Cogut Institute for the Humanities, Data Science Institute	Holly Case	Summer School on the Theme of "Ritual"
History, John Carter Brown Library	Karin Wulf	Brown 2026
History, John Carter Brown Library	Karin Wulf	Early American Women Writers
History, Portuguese & Brazilian Studies	Gabriel Rocha	Polyphonic Archives: Researching the Atlantic World of an Eighteenth-Century Newport Merchant [This project

		is cross-listed with the Brown Laidlaw Scholars Program.]
Institute at Brown for Environment and Society (IBES)	Mindi Schneider	Storytelling for Environmental Justice [This project is cross-listed with the Brown Laidlaw Scholars Program.]
International and Public Affairs, Political Science	Tyler Jost	Origins of Major Power Cooperation
Linguistics, Anthropology	Scott AnderBois	Boom! Pop! $%!@! – developing a course on the grammar of iconicity and expressivity
Linguistics, Anthropology	Scott AnderBois	Pedagogical grammar of A'ingae, an indigenous language of Amazonia [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Linguistics, Philosophy	Pauline Jacobson	Course Development for a new course: Language and the Law
Mathematics	Melody Chan	Computations and Conjectures in Algebraic Combinatorics
Medical Science	Neil Sarkar	Structuring Evidence for Alternative Drug Indications from International Regulatory Sources and Published Literature
Medical Science	Neil Sarkar	Structuring Traditional Chinese Medicine Food Therapies for Contemporary Health Applications
Medicine	Gideon Koren	Cardiac-Specific AAV9 Gene Therapy Engineering for Long QT Syndrome Type 2
Medicine	Hongwei Yao	Metabolic dysregulation in right ventricle of pulmonary hypertension
Medicine - research to be conducted in space provided by the department of pathology	Alexander Raufi	Humanized patient-derived xenograft mouse models to evaluate novel immune

		checkpoint inhibitor combinations for biliary tract cancers
Medicine, Behavioral and Social Sciences, Psychiatry and Human Behavior	Joseph "Greg" Rosen	Human-Centered Design to Co-Create Burnout-Mitigating Interventions for Rhode Island's Frontline Harm Reduction Workforce [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Medicine, Biostatistics	Jeremy Warner	HemOnc Knowledge Base [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Medicine, Biostatistics	Jeremy Warner	The COVID-19 and Cancer Consortium (CCC19)
Medicine, Family Medicine	Melissa Palma	TayoHelp.com: Culturally Tailored Health Education for Filipino Americans [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Medicine, laboratory work will be conducted in space provided by the department of pathology	Alexander Raufi	Imipridones for Chemoprevention of Colorectal Cancer
Molecular Biology, Cell Biology, and Biochemistry	Mamiko Yajima	Cellular and Developmental biology using the sea urchin embryo
Molecular Biology, Cell Biology, and Biochemistry	Nicolas Fawzi	Characterizing biophysical properties of synthetic repeat domains in RNA-binding proteins
Molecular Biology, Cell Biology, and Biochemistry	Mamiko Yajima	Computationally identifying the mechanism of Vasa function in RNA biogenesis
Molecular Biology, Cell Biology, and Biochemistry	Mark Johnson	Gamete fusion and the block to polyspermy
Molecular Biology, Cell Biology, and Biochemistry	Mark Johnson	The pollen tube: adaptation to climate change at the cellular and molecular level

Molecular Biology, Cell Biology, and Biochemistry, Carney Institute for Brain Science, Neuroscience, Psychiatry and Human Behavior	Eric Morrow	Intellectual Disability and Neurodevelopmental Genetics
Molecular Biology, Cell Biology, and Biochemistry, Pediatrics	Phyllis Dennery	Computational and molecular approaches to understanding developmental senescence
Molecular Microbiology and Immunology	Karthikeyani Chellappa	Exploring How NAD Metabolism Shapes Microbial Ecosystems
Molecular Microbiology and Immunology	Christina Cuomo	Genetic mechanisms of antifungal resistance in Candida auris
Molecular Microbiology and Immunology	Karthikeyani Chellappa	Transport mechanisms of nicotinamide
Neurology	Saud Alhusaini	Fatigue and neuroinflammation in Parkinson's disease
Neuroscience	Carlos Vargas-Irwin	Decoding and signal analysis for intracortical BCIs
Neuroscience	Monica Linden	Updating Neural Systems Workbook
Neuroscience, Carney Institute for Brain Science	Michael Paradiso	Active visual perception
Neuroscience, Carney Institute for Brain Science	Anda Chirila	Curriculum development for a sensory neurobiology course
Neuroscience, Carney Institute for Brain Science	Sonia Mayoral	Investigating the Impacts of Myelin on Axonal Mitochondria
Neuroscience, Carney Institute for Brain Science	David Sheinberg	Is TikTok only for humans?
Pandemic Center, School of Public Health	Elizabeth (Beth) Cameron	Biosecurity Game Changers Initiative
Pathology and Laboratory Medicine	Adina Badea	Identifying trends and unmet needs in clinical toxicology testing using high-resolution mass spectrometry
Pediatrics	Lawren Wellisch	Research in Pediatrics: A map

		of secondary data sources
Pediatrics	Maayan Leroy-Melamed	Sexual and Reproductive Health in Adolescents and Young Adults with Sickle Cell Disease [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Pediatrics	Michael Koster	Vaccine Demand [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Pediatrics, Behavioral and Social Sciences, Psychiatry and Human Behavior	Sheryl Kopel	Pediatric Behavioral Health Research: sleep, diet, asthma, and immune function
Physics	Loukas Gouskos	AI-Guided Optimization of Cyclotron Medical Isotope Production
Physics	Matt LeBlanc	Building the Tools for Discovery: Open Source Software Developments for Particle Physics
Physics	Jennifer Roloff	Characterization and readout of silicon detectors for high energy physics applications
Physics	Ian Dell'Antonio	Diffuse Halos of Galaxies and the Intra-Cluster Light
Physics	Matthias Kuehne	Electrothermal investigations of nano-confined water
Physics	Matthias Kuehne	Intercalation of 2D materials heterostructures
Physics	Greg Landsberg	Je charge tagging at the Large Hadron Collider
Physics	Ian Dell'Antonio	Measuring the infrared emission from galaxy clusters
Physics	JiJi Fan	The Juno mission as a probe of new physics beyond the Standard Model of particle physics

Physics	Loukas Gouskos	Ultra-Fast AI and Detector Design for the Next Generation Particle Colliders
Physics	Matt LeBlanc	Understanding jets at the future Muon Collider
Physics	Greg Landsberg	Unsupervised anomaly detection in jets at the Large Hadron Collider
Physics, Engineering	Jay Tang	Microscopic imaging of swarming and biofilm growth of bacteria on surfaces
Physics, Neuroscience	Leenoy Meshulam	Emergent Rhythms: constructing artistic display of smartphone-based system to investiagte collective behavior
Political Science, International and Public Affairs	Robert Blair	Civil Conflict and Democratic Erosion Policy Lab UTRA
Political Science, International and Public Affairs	Prerna Singh	Measuring State Symbolic Power: The Cultural and Ideational Components of State Capacity
Political Science, International and Public Affairs	Jennifer Hadden	Power Shifts: Transnational Advocacy Networks and the Politics of Coal
Population Studies and Training Center	Margot Jackson	Undergraduate Research Fellows for Social Science and Public Policy
Psychiatry and Human Behavior	Grace Cushman	Developing Behavioral Health Interventions to Improve Food Allergy Management
Psychiatry and Human Behavior	Anna Yeo	Dietary Patterns and Asthma in Children
Psychiatry and Human Behavior	Hannah Frank	Project REACH (Raising Exposure Awareness for Caregiver Help-Seeking) [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Psychiatry and Human Behavior, Behavioral and Social Sciences, Neuroscience	Carolina Haass-Koffler	Clinical Trials in Addiction Medicine and Comorbidities
Psychiatry and Human Behavior, Behavioral and Social Sciences, Religious Studies	Tosca Braun	Integrative Wellbeing for Survivors of Violence: A Community-Engaged Study [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Psychiatry and Human Behavior, Carney Institute for Brain Science	Sarah Thomas	Investigating Adolescent Cannabis Use With Neurobehavioral Methods
Psychiatry and Human Behavior, Cognitive and Psychological Sciences	Laura Korthauer	Remote digital cognitive assessment in rural older adults [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Psychiatry and Human Behavior, Pediatrics	Michelle Pievsky	Evaluating the Current State of Communication Between Local Primary Care Physicians and Elementary Schools [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Radiology	Zhicheng Jiao	NeuroRad Agent: An AI Assistant for Quantitative Neuro-Oncologic Imaging and Tumor Response Evaluation
Sociology	John Logan	Mapping segregation and neighborhood inequality
Surgery	Ruhul Abid	CardioPulmonary Vascular Disease Study
Surgery	Ruhul Abid	Mapping of a Referral System for Chronic Non-Communicable Diseases in Humanitarian Crisis Settings [This project is cross-listed with the Brown Laidlaw Scholars Program.]
Surgery	Frank Sellke	Study of microcirculation after cardiac surgery

Faculty Opportunities

Ruhul Abid
Department: Surgery
Project Type: Research
Project Title: CardioPulmonary Vascular Disease Study

Project Description:
This project will investigate the role of sub-cellular oxidant signaling using coronary vascular endothelial cells, transgenic animals, antioxidant nanoparticles and extracellular vesicles in Cardiovascular and Pulmonary Vascular Diseases. The major focus of this research program is on cardiovascular and pulmonary health, with a particular focus on how oxidant signaling influences mitochondrial functions, oxidative stress responses, and endothelial function in ischemic heart disease and pulmonary hypertension. The goal is to better understand the mechanisms underlying cardiovascular disease, pulmonary hypertension, and vascular dysfunction, and to identify potential therapeutic strategies. Students will participate in a variety of laboratory techniques, including endothelial and bone-marrow stem cell isolation and culture, extracellular vesicle isolation and characterization, molecular assays (PCR, Western blotting), and functional assays to evaluate endothelial and mitochondrial activity. Work may also involve imaging techniques and data analysis to assess cellular responses to oxidative stress. Advanced and diligent students who plan for long-term research will be provided with the opportunity to develop and study ischemic heart disease, myocardial infarction and pulmonary hypertension models using transgenic animals for in vivo study.

Required qualifications:
- Strong attention to detail and willingness to learn new methods.
- Commitment to working collaboratively in a research team.
- Basic laboratory skills, with prior exposure to cell culture or molecular biology.
- Laboratory skills include, but are not limited to, pipetting, knowledge of gel electrophoresis principles, PCR, cell culture methodology/practice, and willingness or experience with animal work

Preferred qualifications: Experience with mammalian cell culture and/or molecular biology, imaging techniques.
- Familiarity with assays involving oxidative stress, endothelial biology, or mitochondrial function.
- Some experience with animal/rodent handling
- Interest in translational cardiovascular research.

Modality: In person

Is this project for more than one student: No

Ruhul Abid
Department: Surgery

Project Type: Research
Project Title: Mapping of a Referral System for Chronic Non-Communicable Diseases in Humanitarian Crisis Settings [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
The students will be involved in the ongoing research work aimed at improving healthcare for the underserved and marginalized populations including refugees who have chronic NCDs (non-communicable diseases). Analyses of the existing infrastructure and identification of the gaps that need to be fulfilled for a quality healthcare will be a priority of the program. A geophysical and interactive map showing the primary, secondary and tertiary healthcare facilities' geolocation, available resources as well as distance and transportation facilities from the patients' households will be among the major deliverables of the project. More information on the digital health platform can be obtained from : www.haefa.org

Required qualifications: knowledge and experience in map or website development, working with a large team, and International travel.

Preferred qualifications: knowledge and experience in map or website development, working with a large team, and International travel.

Modality: In person

Is this project for more than one student: Yes

Saud Alhusaini
Department: Neurology
Project Type: Research
Project Title: Fatigue and neuroinflammation in Parkinson's disease

Project Description:
The overall goal of this study is to clarify the role of neuroinflammation in contributing to fatigue in Parkinson's disease (PD). Our specific aims include:
1) To determine the prevalence and severity of fatigue in a local cohort of idiopathic PD patients using validated, standardized fatigue assessment scales.
2) To investigate the association between peripheral neuroinflammatory markers and fatigue in PD by comparing serum neuroinflammatory markers in PD patients with fatigue to those without fatigue.

Required qualifications: Good communication skills, ability to interact with patients.

Preferred qualifications: Basic coding skills with python, matlab, or R are desirable (not essential)

Modality: In person

Is this project for more than one student: Yes

Scott AnderBois
Department: Linguistics, Anthropology
Project Type: Course Development
Project Title: Boom! Pop! $%!@! – developing a course on the grammar of iconicity and expressivity

Project Description:
When we think of language use both as linguists and in our everyday lives, we often focus on descriptive uses of language in which words and other grammatical elements are related to the things they refer to in an arbitrary fashion. But language also has ample depictive uses, in which words and other grammatical elements are mapped to their meanings in ways that are far from arbitrary, what is known as iconicity. There are various types of iconicity. On one end of the spectrum, we find imagic iconicity, e.g. an onomatopoeic word like “pop” that paints a verbal picture of the sound to which it refers (cross-linguistically, both signed and spoken languages have similar phenomenon in domains other than sound). On the other end, we find diagrammatic iconicity, in which the relationships between different forms reflects relationships between their meanings. For example, the emotional immediacy of curse words like the f-word is mirrored in their “grammatical immediacy”, e.g. the f-word can appear in the middle of a word like fan-f$%!@ing-tastic. We also find various recurrent patterns in which the ordinary grammar of languages reflects similar sorts of iconicity. For example, many language have reduplication processes in which a word is partially or fully repeated in iconic fashion (e.g. Malay orang means “person” singular, while orang-orang means “people” plural).

In this UTRA project, a student will work with me to support the development of a new 1000-level linguistics course to be taught in Spring 2027 exploring different kinds of iconic language, expressive grammar, and depictive uses of language. The course will aim for broad cross-linguistic coverage, drawing on existing readings and research on a range of spoken and signed languages. We will do this by creating an annotated bibliography organized thematically and think together about the best way to structure the topics of the course to support student learning, as well as potential assessments, class activities, etc.

Required qualifications: Introduction to Linguistics LING 0100 or ANTH 0800 Sounds and Symbols or similar

Preferred qualifications: Any 1000-level coursework in linguistics

Modality: In person

Is this project for more than one student: No

Scott AnderBois
Department: Linguistics, Anthropology
Project Type: Research
Project Title: Pedagogical grammar of A’ingae, an indigenous language of Amazonia [This project

is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Over the past 10 years, the A'ingae Language Documentation Project (ALDP) has curated 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 recent project that is nearing completion is the first comprehensive dictionary of A'ingae with definitions in A'ingae and example sentences for all entries. In the course of this project, our A'i colleagues have expressed that a useful complement to this would be basic grammatical description of the grammar of the language (in Spanish). So, we are now beginning work on a pedagogical grammar, that is a work that translates specialist research on the grammar of A'ingae to be intelligible to teachers, language activists, and community members who may not have linguistic training or knowledge of technical vocabulary.

Students in this project will work in partnership with myself, other students and researchers, and with A'ingae-speaking colleagues in Ecuador to create a pedagogical grammar. Students will learn about A'ingae grammar generally from prior scholarly research and then in consultation with our A'i colleagues, select a specific area of A'ingae grammar to learn more about and then work to produce the corresponding section of the pedagogical grammar, working with A'i colleagues to ensure intelligibility and accuracy.

Overall, students will gain experience in linguistic analysis, community-engaged scholarship, and the linguistics of an understudied indigenous language.

Required qualifications: Solid Spanish language proficiency and either Introduction to Linguistics LING 0100 or another similar introductory course (e.g. CPSY 0800 Language and Mind, ANTH 0800 Sounds and Symbols)

Preferred qualifications: Any 1000-level coursework in linguistics

Modality: In person

Is this project for more than one student: Yes

Elizabeth Aston
Department: Behavioral and Social Sciences
Project Type: Research
Project Title: 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

Modality: In person

Is this project for more than one student: Yes

Adina Badea
Department: Pathology and Laboratory Medicine
Project Type: Research
Project Title: Identifying trends and unmet needs in clinical toxicology testing using high-resolution mass spectrometry

Project Description:
The drug use and exposure landscape is constantly changing, and clinical toxicology testing strategies need to adapt on a rapid basis to stay relevant to patient care. This project aims to determine trends in drug use and exposure, identify emerging drugs in the local patient population, and potentially identify novel targets for future testing using high-resolution mass spectrometry. The student will retrospectively analyze and generate data using a high-resolution mass spectrometry platform that collects toxicological data in an untargeted fashion. They will learn how to interpret mass spectrometry data, work with large datasets, and communicate clinically relevant drug use information.
Over the course of the project, students will also learn more about drug pharmacokinetics and pharmacodynamics. As drug use can be identified not only by the parent drug but also by its metabolite(s), students will learn more about drug metabolism and use their knowledge to predict

potential metabolites.
An important part of toxicology is how a clinical presentation is related to the entirety of a patient's pharmaceutical use. As an example from the local Rhode Island community, our research group has previously found that illicit fentanyl is often mixed with xylazine, a veterinary sedative not approved for human use. This mixture was correlated with the clinical presentation of more pronounced sedation and severe skin lesions, complicating overdose cases. Therefore, clinical records will also be reviewed to correlate the clinical picture and outcomes with the results of the retrospective data analysis to identify gaps and unmet needs in clinical toxicology testing.

Required qualifications: Organic chemistry course experience
Physiology or other relevant course experiences
Proficient in MS Suite (Word, Excel)

Preferred qualifications: Any prior courses related to toxicology, pathophysiology, or pharmacology
Pipetting experience
Comfortable in a lab-based workspace

Modality: In person

Is this project for more than one student: No

David Badre
Department: Cognitive and Psychological Sciences, Carney Institute for Brain Science
Project Type: Research
Project Title: How does brain stimulation affect cognitive control processes?

Project Description:
Think about all the different things you do in a single day. How does your brain switch from doing one thing, like chatting with a friend, to doing another, like reading a chapter? This may seem simple, but computationally, it is a complex problem for a biological neural system like your brain to solve. How do you do it? This project will investigate which areas and/or networks of the brain contribute to specific cognitive functions, by stimulating them using TMS (Transcranial Magnetic Stimulation), or by using EEG (electroencephalography) to record neural activity while subjects perform different tasks. The student will assist in recruiting and consenting human subjects, as well as running experiments and collecting neurophysiological data. The student will be educated on all aspects of TMS, including the theory underlying the technique, how to safely operate a TMS device, and the types of questions that can be answered via brain stimulation. The student will also learn about the origin of EEG signals and the various methods used to analyze such data. These methods include more classical techniques (event-related potentials & time-frequency decomposition) as well as newer Machine-Learning techniques. Additionally, the student will be trained in basic to advanced data analysis techniques and given exposure to programming as it relates to scientific exploration. This project will offer the mentee the unique opportunity to be trained on a technique which is applicable in a wide variety of fields, from medicine to basic science. They will gain confidence and clarity in the research process.

Required qualifications: Prior coursework in cognitive psychology or neuroscience

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

Modality: In person

Is this project for more than one student: No

David Badre
Department: Cognitive and Psychological Sciences, Carney Institute for Brain Science
Project Type: Research
Project Title: How does multitasking training affect neural representations?

Project Description:
The project is focused on investigating the neural basis of human multitasking. Humans are profoundly limited in their ability to perform more than one task concurrently. There is a long-standing debate in neuroscience about the underlying cause of this multitasking capacity limit. The goal of the project is to understand the contribution of the human prefrontal cortex to multitasking. In particular, the focus is on identifying changes in 'neural representations' in the human prefrontal cortex that occur as a result of practice with multitasking. The student will join a team of researchers executing an ambitious study that combines behavioral and neuroimaging (both fMRI and EEG) measurements in the context of a randomized controlled trial to identify the impact of multitasking training on neural representations. The student will assist in fMRI and EEG data collection and will be involved in data quality assessment, preprocessing, and statistical modelling and analysis for fMRI studies. The student will also be encouraged to read foundational articles in the field related to their research, to write a list of questions and critiques of those papers, and discuss these with lab members. The project will involve learning about concepts at the intersection of psychology, neuroscience and machine learning.

Required qualifications: Prior coursework in cognitive psychology or neuroscience, as well as statistical methods; Prior experience with coding

Preferred qualifications: Prior experience with behavioral data collection is preferred

Modality: In person

Is this project for more than one student: No

Michael Barnett
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Health Care Access and Quality

Project Description:
Professor Michael Barnett conducts health services research to better understand and develop policies

that will promote access to high quality care, improve patient outcomes, and drive structural change in U.S. health care delivery. He is seeking an undergraduate research assistant (RA) to support a portfolio of projects related to this work. Representative ongoing projects include:

Nurse practitioner education study
Nurse practitioners (NPs) play an increasingly important role in the U.S. health system. Simultaneously, NP education has exploded, with many relatively new models for clinical education including distance/online education, for-profit nursing schools, and “accelerated” nursing programs that license students with no prior nursing experience for independent practice within a short period of time. This project studies the association of educational characteristics with NP quality of care. The RA will support the project through tasks such as literature searches, submitting and negotiating Freedom of Information Act (FOIA) requests with state governments, and data analysis. The RA will gain experience interacting with government agencies and compiling and reconciling messy, real-world datasets to answer timely policy research questions.

Primary care provider access study
Timely access to primary care is critical for effective health systems, yet many patients struggle to secure new patient appointments, face long wait times and encounter substantial geographic variation. Preliminary data collected using simulated patient (‘secret shopper’) calls by members of our team found Medicare acceptance rates ranging from 35% in Portland to 97% in Los Angeles, and physician wait times ranging from a median of 8 to 61 days. There is little evidence on what explains such wide variation in wait time. Our project aims to assess primary care access and related factors by using AI voice agents to conduct secret shopper calls. The RA will support the project through data collection and oversight of the AI agents conducting the calls. The RA will gain experience using AI in novel study methods.

Required qualifications: Experience conducting searches of scientific and/or grey literature and communicating findings to others.

Preferred qualifications: Experience with R or other statistical programming language.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Emmanuelle Belanger
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Determining Ownership of Hospice Agencies by Medicare Advantage Organizations

Project Description:
Medicare Advantage (MA) organizations differ widely in size and structure, with some owning health systems and hospice agencies and making strategic decisions shaped by their networks. As part of a larger evaluation of the Centers for Medicare & Medicaid Services’ Value-Based Insurance Design-Hospice Benefit Component (VBID-HBC), this project will use large language models (LLMs) to build a dataset on MA ownership of hospice agencies. The project will adapt existing R scripts that integrate

LLMs to identify public information on hospice agency acquisitions and parent company affiliations with MA organizations.
The student researcher will assist in running the LLM-based tools, validating results through manual online searches, and contributing to quantitative data analysis (e.g., preparing and interpreting tables). They will also conduct a literature review and collaborate on the development of a peer-reviewed manuscript. Through this work, the student will gain hands-on experience with innovative applications of LLMs in health services research, acquire skills in data validation and descriptive analysis, and strengthen their ability to present research findings clearly. This project is part of a broader research initiative evaluating the VBID-Hospice Benefit Component.

Required qualifications: Ability to conduct literature reviews and summarize findings
Introductory knowledge of statistics
Knowledge of R software and prior experience using LLM

Preferred qualifications: Interest in or familiarity with hospice care and Medicare Advantage

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Emmanuelle Belanger
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: A Palliative Care Quality Improvement Project in Partnership with a Large, Non-Profit Provider [This project is cross-listed with the Brown Laidlaw Scholars Program.]

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 over three years of quality improvement data (2022-2025) for approximately 15,000 patients who received palliative care consultations through a large, non-profit hospice and palliative care provider in New England. The study will consist of generating quality indicators to inform the clinical team of their performance, including quarterly rates of symptom management, assessment of spiritual and emotional needs, etc.
The student involved in this project will help with quantitative data analysis (e.g., populating and interpreting graphs and tables), conduct a literature review, and contribute to the development of a data collection instrument for a community-partnered study. They will gain experience in presenting research findings clearly, including descriptive statistics. This project is part of a broader research initiative focused on understanding palliative care delivery in the U.S.

Required qualifications: Ability to conduct literature reviews and summarize findings
Introductory knowledge of statistics

Preferred qualifications: Interest in or familiarity with palliative or end-of-life care

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Keisha Blain
Department: Africana Studies, History
Project Type: Research
Project Title: Black Thinkers: The Global Impact of Black Intellectual Thought

Project Description:
I am looking for a student interested in conducting research for a book I am writing on the global impact of Black intellectual thought. Drawing insights from an array of sources, including archival collections, historical newspapers, and organizational records, the book highlights the ideas of a cadre of influential Black intellectuals across the globe. It brings together a core group of intellectuals, including Jane and Paulette Nardal of Martinique, Steve Biko of South Africa, and French West Indian Frantz Fanon. From the 1940s through the 1990s, these figures engaged Black internationalist ideas in diverse and expansive ways—to describe the political and cultural ways Black communities collectively raised questions of struggle and liberation on a global scale; to underscore how Black people across the diaspora envisioned themselves beyond the boundaries of nation states; and to capture how people of African descent forged transnational collaborations and solidarities with other people of color. The intellectuals featured in this book underscore the global and enduring impact of Black thinkers.

Much of the research for the project will be conducted at Brown with a focus on collections at the John Hay Library, the Pembroke Center, and the John Carter Brown Library. Research will include collecting and organizing primary sources; and reading, summarizing, and analyzing historical documents such as historical newspapers, organizational records, and archival material. Some of the work required for the project includes using online databases such as ProQuest and JSTOR.

Required qualifications: Strong research, writing, and communication skills.

Preferred qualifications: Previous coursework in Africana Studies and/or African American history. Strong note-taking and organizing skills.

Modality: In person

Is this project for more than one student: No

Keisha Blain
Department: Africana Studies, History
Project Type: Course Development
Project Title: Black transnationalism

Project Description:
Black transnationalism is an undergraduate seminar in the Department of Africana Studies, which has not been offered since 2016. The instructor is reviving the course, which will be offered in spring 2027. By reviving this course, the instructor aims to build on the themes and concepts explored in earlier iterations of the course while also introducing new materials and concepts that draw from the instructor's original research and writing.

The course will introduce students to the complex dynamics of Black transnationalism during the 20th century, focusing on the global visions; transnational activities; and transracial political alliances of people of African descent worldwide. The course highlights several key areas of inquiry including the role of race, ethnicity, religion, gender, nationality, class and sexuality in shaping Black transnational movements and discourses. It also explores the connections between Black transnationalism and other philosophies including Pan-Africanism, Black nationalism, and cosmopolitanism. Course readings will represent a combination of primary and secondary sources that reflect the geographical breadth of the African Diaspora including Africa, the Americas, and Europe.

The student collaborator will have an opportunity to work closely with the instructor on developing the new version of the course. They will contribute in several tangible ways throughout the summer months: In addition to helping the instructor track down relevant primary and secondary sources for the syllabus, the student collaborator will help identify new films and multimedia that would enhance the teaching of the course. Additional tasks include gathering previous course syllabi; uploading and organizing documents, readings, and other materials to the course's online learning platform; helping to identify guest lectures for selected units; and helping to redesign presentation slides with an eye for greater student engagement.

Required qualifications: Strong research, writing, and communication skills.

Preferred qualifications: Previous coursework in Africana Studies and/or African American history. Strong note-taking and organizing skills.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Robert Blair
Department: Political Science, International and Public Affairs
Project Type: Research
Project Title: Civil Conflict and Democratic Erosion Policy Lab UTRA

Project Description:
Professor Robert Blair is seeking one or more student research assistants to contribute to several ongoing research projects being conducted through the Civil Conflict and Democratic Erosion Policy Lab at the Watson School, which he directs. Current projects include (1) a randomized controlled trial evaluating mechanisms to prevent violence against land and environmental activists in the Brazilian Amazon; (2) a case study of the life cycle of cocaine production, export, and interdiction in Colombia; (3) a re-analysis of decades of quantitative peacekeeping studies to test whether United Nations intervention is effective outside of the African contexts that have been the focus of most research to date; and (4)

collection, quality control, and analysis of the Democratic Erosion Event Dataset (DEED), a unique data collection exercise that captures the specific events that contribute to democratic deterioration across more than 170 countries around the world. (This latter project is part of the Democratic Erosion Consortium, which Professor Blair co-directs.) Students will be paired with projects based on interest, skillsets, and need. For example, students who speak fluent Portuguese may be invited to work on the project in the Brazilian Amazon; students with prior data collection experience may be asked to work on DEED.

Students can learn more about Professor Blair's research here: robblair.net. They can learn more about the Policy Lab here: https://home.watson.brown.edu/research/research-policy-labs/civil-conflict-and-democratic-erosion-lab. They can learn more about the Democratic Erosion Consortium here: https://democratic-erosion.org/.

Required qualifications: Self-starter, effective and reliable communicator, accountable team member, creative problem-solver

Preferred qualifications: Fluency in Spanish and/or Portuguese; experience with Stata and/or R; proficiency in LaTeX/Overleaf; courses in political science and other social sciences

Modality: Remotely

Is this project for more than one student: Yes

Elizabeth Brainerd
Department: Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Biomechanics of Heron Feeding Strikes

Project Description:
This project examines the heron feeding strike to uncover mechanical principles about how flexible, multi-jointed structures generate rapid and precise movements. The undergraduate student(s) will contribute by working with motion data collected from herons in natural settings. Depending on project needs at the time, the student may help collect high-speed videos in the field, analyze video sequences, work with positional tracking data, and/or assist with computational models to quantify movement patterns. Tasks may include digitizing movement, processing kinematic variables (e.g., displacement, velocity, acceleration), visualizing trajectories, or preparing simplified representations of skeletal motion. No prior experience is expected; all necessary training will be provided. This opportunity will allow the student to develop core research skills in biomechanics, quantitative data analysis, and scientific communication, with opportunities to learn basic coding or computational modeling depending on interest and research needs.

Required qualifications: No prior experience is required; all necessary training will be provided.

Preferred qualifications: Videography, photography, birdwatching, or field biology experience; coding in any computer language; quantitative analytical skills. Preferred coursework in Ecology, Evolution, Organismal Biology, or related fields.

Modality: In person

Is this project for more than one student: Yes

Kenny Breuer
Department: Engineering, Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Blowing (and Bending) in the Wind - flexible Structures in Nature and Engineering

Project Description:
Structures that bend and deform (and break) in a flow are everywhere - in nature (trees, seal whiskers, fish fins, bird wings), sport (sailing, hang-gliding), our built environment (skyscrapers, wind turbine blades, power lines, marine cables), etc. Unfortunately, fluid-structure interactions are still difficult to model and predict. Our experiments involve measurements of highly elastic structures that exhibit extreme deformations. You will conduct the experiments in either our wind tunnel, or our water tunnel testing facility, and measure the shape of the structures as they bend due to the flow, the forces generated by the flow, and the complex turbulent and unsteady the velocity wake behind the structure (using "Particle Image Velocimetry"). We have several possible projects with different applications from the examples above.

Required qualifications: Quantitative classes in a STEM field. Interest in hands-on science (e.g. robotics, electronics, theatre set building, FSAE Car team, sculpture, model airplanes, etc).

Preferred qualifications: CAD, Programming (esp. Matlab/Python) and a class in Fluid Mechanics are all added advantages.

Modality: In person

Is this project for more than one student: Yes

Kenny Breuer
Department: Engineering, Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Dynamics of Offshore Wind Turbines

Project Description:
Wind turbines are getting larger and larger and increasingly are being deployed offshore, in deep ocean waters which requires them to be mounted on floating platforms, not anchored in bedrock. We are studying the unique environment of these huge turbines, which includes the effects of the non uniform velocity in the ocean boundary layer, atmospheric turbulence, and rocking that the turbines experience due to wave motion that causes the mounting platform to pitch back and forth, We conduct experiments in the 1.2x1.2 meter wind tunnel at brown using a scale model of a floating turbine. Our experiments

include performance measurements as well as particle image velocimetry of the velocity fields in the wave of the wind turbine.

Required qualifications: Quantitative classes in a STEM field. Interest in hands-on science (e.g. robotics, electronics, theatre set building, FSAE Car team, sculpture, model airplanes, etc).

Preferred qualifications: CAD, Programming (esp. Matlab) and a class in Fluid Mechanics are all added advantages.

Modality: In person

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 17mo - 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 25 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/cocodevlab/. 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.

Modality: In person

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 25 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.

Modality: In person

Is this project for more than one student: No

Elizabeth (Beth) Cameron
Department: Pandemic Center, School of Public Health
Project Type: Research
Project Title: Biosecurity Game Changers Initiative

Project Description:
https://pandemics.sph.brown.edu/our-work/biosecurity-game-changers-initiative
Next-generation health security leaders who will be making decisions about biological threats and pandemic risks must be globally networked and highly capable of envisioning, preparing for, and preventing worst-case biological scenarios. They must be immediately ready and effective at recognizing, preventing, and mitigating large-scale biological crises - looking beyond surface-level threats and leveraging key strategies to stay ahead of the risks.

The Biosecurity Game Changers Initiative, led by the Pandemic Center, is dedicated to shaping these future leaders in biosecurity and biosafety. This ongoing initiative includes three key components:

Biosecurity Game Changers Fellowship – A deep-dive program for emerging leaders.

Pandemic Game Changers Course – A training course focused on critical skills.

Next Generation Workshops – Hands-on sessions for building expertise and networks.

Together, these efforts cultivate the skills, knowledge, and global connections needed to drive real change in biosecurity.

Required qualifications: Strong written and verbal communication skills. An ability to work effectively within a team and contribute to a collaborative environment. The ability to prioritize tasks, meet deadlines, and manage a workload effectively.

Preferred qualifications: A demonstrated interest or academic background in public health, global health, or a related scientific field. Experience with planning, executing, and managing project timelines and deliverables. Research and analytical skills.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Lindsay Caplan
Department: History of Art and Architecture
Project Type: Course Development
Project Title: Global History of Art and Architecture

Project Description:
This student would work with Department of Art History and Architecture Profs. Margaret Graves and Lindsay Caplan to develop strategies for teaching “Global History of Art and Architecture (HIAA 0010)” in Fall 2026. After a few years hiatus, we are returning this gateway global and comparative survey course to regular rotation in HIAA. Our goal is to work with a student research assistant to develop new strategies for organizing weekly readings, low-stakes writing, and independent projects. The focus will primarily be on pedagogical strategies, although we will also be working with this student to reimagine aspects of the course content and case studies. Duties will include (but are not limited to): innovating strategies for organizing course sections to foster engaging discussion and collaboration about course

readings; devising ways to take advantage of area archives and museum collections for class visits, research, and low-stakes writing and drawing assignments; compiling a list of library research resources specific to the history of art and architecture as a resource for student final papers and projects; researching strategies for teaching art and architectural history as well as research and writing in the age of AI; working with professors to creatively reimagine and redesign course modules.

Required qualifications: Demonstration of knowledge in art and architectural history and some interest in pedagogy. Strong research, note-taking, and organization skills.

Preferred qualifications: Some knowledge and interest in area museums and archives.

Modality: Remotely

Is this project for more than one student: No

Holly Case, Cynthia Brokaw
Department: History, Cogut Institute for the Humanities, Data Science Institute, History and East Asian Studies
Project Type: Research
Project Title: Summer School on the Theme of "Ritual"

Project Description:
This project entails cooperation on the organization and syllabus construction of a summer school dedicated to the theme of “Ritual.” UTRA recipients will help select readings and other materials, organize them around sub-themes, and formulate questions and activities which will comprise the syllabus for a one-week intensive not-for-credit reading/discussion/writing seminar to be held in Hungary in early July 2026. The theme, "Ritual," will be considered from various disciplinary and source perspectives. These comprise sub-themes such as: religious ritual, state ritual, habit and habitus, ceremony, rites of passage and other communal/social rituals, mating rituals, quasi-rituals, and potentially other themes under the umbrella of “Ritual.” Participants will include students and scholars from institutions in the US and East-Central and Southeastern Europe. The UTRA student(s) would be collaboratively involved in shaping the content, format, and logistics of the seminar together with myself, Cynthia Brokaw (Prof. of History), and our faculty collaborators during the months of May and June 2026. The UTRA student(s) would then also participate in the seminar. It is important to note that for the entirety of the week-long seminar in Hungary, we strongly encourage that participants remain “unconnected” (no internet, computer, or phone use). There will be two emergency contacts on hand for all eventualities.

Required qualifications: An interest in the theme of "Ritual"; an inclination to think across disciplines; a delight in thinking, discussing, reading, and writing.

Preferred qualifications: experience taking courses in both the sciences and humanities/social sciences

Modality: In person

Is this project for more than one student: Yes

Holly Case
Department: History, Cogut Institute for the Humanities, Data Science Institute
Project Type: Research
Project Title: Summer School on the Theme of "Play"

Project Description:
This project entails cooperation on the organization and syllabus construction of a summer school dedicated to the theme of “Play.” UTRA recipients will help select readings and other materials, organize them around sub-themes, and formulate questions and activities which will comprise the syllabus for a one-week intensive not-for-credit reading/discussion/writing seminar to be held in Bulgaria in early June 2026. The theme, "Play," will be considered from various disciplinary and source perspectives. These comprise sub-themes: games and gamification [including “war games” and “game theory,”] conceptual opposites of “play” [earnestness, work, etc.]; carnival, improvisation, repertoire and potentially other themes under the umbrella of “Play.” Participants will include students and scholars from institutions in the US and East-Central and Southeastern Europe. The UTRA student(s) would be collaboratively involved in shaping the content, format, and logistics of the seminar together with myself and Dimiter Kenarov (writer and writing instructor) during the months of May and June 2026. The UTRA student(s) would then also participate in the seminar. It is important to note that the entirety of the week-long seminar in Bulgaria will be “unconnected” (no internet, computer, or phone use). There will be two emergency contacts on hand for all eventualities, but otherwise all participants will be expected to agree in advance to this condition and adhere to it throughout the week of the seminar.

Required qualifications: An interest in the theme of "Play"; an inclination to think across disciplines; a delight in thinking, discussing, reading, and writing

Preferred qualifications: experience taking courses in both the sciences and humanities/social sciences

Modality: In person

Is this project for more than one student: Yes

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

Project Description:
This project explores the design and implementation of next-generation database systems that natively incorporate artificial-intelligence capabilities. Our goal is to create an AI-augmented DBMS—a system that integrates large language models (LLMs) and machine-learning operators directly into the dataflow engine to enable intelligent, data-aware query processing.

Building on our ongoing research, the summer phase will focus on prototyping new query components

that blend structured (SQL-style) and unstructured (text or vector-based) data operations. Students will help design, implement, and benchmark these components within a prototype system, contributing to modules such as semantic query parsing, adaptive execution planning, and AI-assisted data retrieval.

The work combines ideas from database systems, AI/ML, and software engineering, offering hands-on exposure to cutting-edge system building and experimentation. Students will work closely with graduate researchers and collaborators at the Rhode Island Hospital Data Science group to test the system on realistic workloads drawn from healthcare and scientific data.

Participants will develop strong technical skills in modern database architectures, programming for large-scale systems, and applied AI, while gaining experience in research design, collaboration, and scientific communication.

Required qualifications: Coursework or substantial project experience in databases, systems, or software engineering

Proficiency in Python and/or C++

Strong motivation to learn research-grade system design

Preferred qualifications: Prior coursework or experience in AI/ML or natural-language processing

Familiarity with LLM toolchains or APIs

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Ugur Cetintemel
Department: Computer Science
Project Type: Research
Project Title: Impact Afghanistan 2.0 [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
The Impact Afghanistan project is a Brown-led digital initiative to curate and disseminate multidisciplinary research about Afghanistan's post-2021 social, political, and humanitarian conditions. The platform, developed in partnership with the Brown University Library's Center for Digital Scholarship, Afghan students and alumni, and UN affiliates, aggregates research and reports from academic, NGO, and policy sources into a single, searchable knowledge hub.

Following the successful public launch at the 2024 UN Summit of the Future, the Summer 2026 phase—Impact Afghanistan 2.0—will focus on incorporating AI-based features to enhance information discovery and accessibility. The student will help develop intelligent tools for document classification, automatic tagging, and multilingual semantic search. These additions will make it easier for researchers, journalists, and policymakers to identify emerging themes and trace longitudinal developments in human

rights, governance, and education.

The project offers a unique opportunity at the intersection of computing, global affairs, and social impact. The student will gain practical skills in web systems, applied AI/ML, and responsible data stewardship while contributing to a living platform that supports public scholarship and policy work.

Required qualifications: Experience or coursework in web development (front-end or back-end)

Familiarity with Python or JavaScript frameworks

Interest in AI tools and socially responsible computing

Preferred qualifications: Coursework or project experience in AI/ML or NLP

Understanding of UX/UI design principles

Interest in international development or policy data

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Melody Chan
Department: Mathematics
Project Type: Research
Project Title: Computations and Conjectures in Algebraic Combinatorics

Project Description:
This is a project on building and using computational structures in Sage to investigate problems and formulate conjectures in algebraic combinatorics. The basic algebraic combinatorial structure at hand is a partially ordered set, also known as poset. These are finite sets with an order relation that holds "partially," that is, for some but not necessarily all pairs of elements. For this project, there are at least two possible sources of partially ordered sets: the minuscule posets, i.e., posets coming from minuscule representations of complex simple Lie algebras; and lattices of flats, associated to a combinatorial structure called a matroid. The expectation in this project will be to write code in SageMath, a computational algebra software, to formulate, test, and possibly prove conjectures about these structures, while simultaneously learning the conceptual background from combinatorics and algebra from the recent literature.

Required qualifications: Requirements are strong performance in
--linear algebra at the level of Math 520 or Math 540,
--abstract algebra at the level of Math 1530 or higher, and
--(preferred) at least one other algebra related course such as Math 1540, 1560, 1580, 1820A, 1230.

There is no need to write a long cover letter. Instead, please do the following:

(1) In your application's cover letter, list all courses taken in the Brown Math Department, names of professors, and grades received. We may then contact your instructors to request more information about your course performance.

(2) Also, tell us in your cover letter what you would hope to get out of participating in this project. (1-2 sentences are fine; no need to write a long essay.)

(3) Separately, by February 10, 2026, 12PM, submit a short video to us at this URL:
https://forms.gle/15yeV2vQkFdS4FaA7
Detailed instructions for your video are provided at that URL.
Note: the deadline for your video submission falls one week after the application deadline. Applicants who do not submit a video by this deadline will not be considered.

Preferred qualifications: Prior experience with computational mathematics could be useful for a jump start, but is not required.

Modality: In person

Is this project for more than one student: Yes

Karthikeyani Chellappa
Department: Molecular Microbiology and Immunology
Project Type: Research
Project Title: Transport mechanisms of nicotinamide

Project Description:
Nicotinamide adenine dinucleotide (NAD) is a central redox coenzyme and a key regulator of cellular metabolism and signaling. Mammals obtain NAD either through de novo synthesis from tryptophan or through salvage pathways that recycle nicotinamide (NAM) and nicotinic acid. Our previous work demonstrated that NAMPT is the rate-limiting enzyme for NAD^+ synthesis from NAM and is therefore critical for maintaining NAD^+ homeostasis. Despite the importance of NAD metabolism, the mechanisms by which NAM is transported across cellular membranes are poorly understood. The Chellappa lab is actively investigating NAM transport using both unbiased genome-wide approaches and targeted mechanistic studies.

In this project, we will use biochemical, genetic, molecular, and cell-based methods to dissect how NAMPT and associated transport systems regulate NAM movement into and out of cells. Specifically, we will identify NAMPT amino acid residues that control NAM transport. To do this, we will utilize a CRISPR-based lentiviral library of 398 guide RNAs that introduce single-amino-acid changes across 92% of the NAMPT coding sequence. Cells expressing these variants will be subjected to different NAM concentrations, and genomic sequencing of surviving populations will reveal candidate residues essential for NAMPT-mediated transport. Promising NAMPT mutations will then be engineered and tested directly in NAM transport assays and used in downstream mechanistic studies. Ultimately, this work aims to define how NAMPT regulates NAM transport and to uncover fundamental principles governing cellular NAD metabolism.

Required qualifications: The student should have a foundational understanding of the central dogma of life. Coursework in Cell Biology, Biochemistry, or Molecular Biology is highly preferred. The student should demonstrate a strong interest in research; however, prior research experience is not required.

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: No

Karthikeyani Chellappa
Department: Molecular Microbiology and Immunology
Project Type: Research
Project Title: Exploring How NAD Metabolism Shapes Microbial Ecosystems

Project Description:
Nicotinamide adenine dinucleotide (NAD) is a critical redox coenzyme and a key regulator of metabolism and signaling across all domains of life, from mammals to the trillions of microorganisms that inhabit the human body. Research on NAD metabolism has uncovered core biochemical principles and has been recognized with four Nobel Prizes. Yet, despite its importance, NAD metabolism within the gut microbiome remains relatively unexplored. Our recent work using stable-isotope tracing and metabolomics revealed that dietary fiber and host-derived nicotinamide serve as the dominant precursors for microbial NAD biosynthesis in the gut. Building on these findings, the Chellappa Lab investigates NAD metabolism at the host–microbiome interface using a combination of in vivo mouse models, ex vivo synthetic community cultures, and fecal microbiota cultures. In parallel, we apply computational approaches, including metagenome assembly and regulatory analysis, to uncover genetic determinants of NAD synthesis and consumption in microbial ecosystems.

In this project, we will use in vitro microbial culture systems to examine how NAD metabolism shapes community composition and function. By pharmacologically and genetically modulating NAD biosynthetic and catabolic processes, we will test how perturbations in NAD availability alter symbiotic and competitive interactions among bacterial species. Both in-house 16S rRNA and shotgun metagenomic datasets, along with publicly available resources, will be leveraged to identify mechanisms by which NAD influences microbial ecology. For the summer UTRA project, we seek an undergraduate researcher with a strong interest in computational biology who is eager to apply data-driven approaches to biological questions and engage with real experimental datasets.

Required qualifications: Students should be interested in computational biology and be comfortable learning data analysis platforms and working with publicly accessible databases. Students should demonstrate a strong research interest; however, prior research experience is not required.

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: No

Anda Chirila
Department: Neuroscience, Carney Institute for Brain Science
Project Type: Course Development
Project Title: Curriculum development for a sensory neurobiology course

Project Description:
Assist Dr. Chirila with curriculum development for a new neuroscience course on the topic of somatic sensation. The student researcher will help to: develop a course syllabus; search for textbooks/journal articles; create PowerPoint slides; develop assessments; plan pedagogical strategies; and other related tasks. The student researcher will be expected to work both independently and collaboratively. Weekly meetings (in person or remote) with Dr. Chirila will be required with more added, if needed.

Required qualifications: N/A

Preferred qualifications: Background in biology (completed multiple courses in neuroscience/cell biology/biological sciences); Competency with Microsoft Powerpoint

Modality: In person

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 epigenetics in psoriasis (PsO) and psoriatic arthritis (PsA). This project aims to explore biological age markers based on DNA methylation patterns, and its potential connections with disease progression and outcomes in PsO and PsA patients.

This project builds on existing research and data on epigenetics in PsO and PsA patients. By analyzing data that we have not yet explored in earlier studies, 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 and PsA 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.

Preferred qualifications: Familiarity with statistical software (e.g., R, Python) and an interest in epigenetics will be beneficial.

Modality: In person

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 clinical 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 of patient data. Furthermore, students will access electronic 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.

Modality: In person

Is this project for more than one student: No

Melissa Clark
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Evaluating The Effectiveness Of Mode Of Meal Delivery On The Ability Of Homebound Older Adults To Remain In The Community [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
This project supports a clinical trial to better understand the health and social benefits that homebound adults experience from receiving meals through Meals on Wheels America. We will be comparing the benefits of traditional home delivered meals to alternate methods of frozen meal delivery through the mail. By studying participants who receive these two options, we will better understand how they are different and similar.
This UTRA project will support the dissemination of study results and the execution of the publications plan. The UTRA student will be updating our database of relevant literature and organizing the literature around the six main research aims of the project. The student will work with a mentor to develop literature summaries on different topics that will be used in the development of academic manuscripts. The student will then work with our Stakeholder Advisory Panels to translate dense academic language into user-friendly products that can engage the wide range of project stakeholders including Meals on Wheels leadership, paid and volunteer drivers, and adult adults who are meals recipients. Lastly, the student will help update our citation database to reflect the new materials and automate the development of publication references.
For more information:
https://sites.brown.edu/deliveree/

Required qualifications:
- Student has completed related coursework in topics such as: research methods, nutrition, gerontology, health services, and/or quantitative/qualitative methods.
- Ability to work independently and as part of a team
- Ability to communicate clearly by email, Zoom, and phone
- Ability to communicate with diverse audiences
- Ability to manage time effectively and meet assigned deadlines
- Ability to break down complex transactions into elementary tasks
- Interest in conducting comprehensive literature searches
- Ability to maintain confidentiality of sensitive information

Preferred qualifications:
- Familiarity with software such for citation management such as Zotero or EndNote
- Familiarity with the Brown library catalog and digital repositories
- Familiarity with research ethics/CITI trained

Modality: Remotely

Is this project for more than one student: No

Christopher Cleveland, Anna Aizer, Margot Jackson
Department: Education, Annenberg Institute, Economics , Population Studies and Training Center
Project Type: Research
Project Title: Undergraduate Research Fellows for Social Science and Public Policy

Project Description:
The Undergraduate Research Fellows (URF) for Social Science and Public Policy program is an eight-week, paid summer internship that prepares current Brown undergraduates to work as research

assistants on empirical social science and public policy projects, including those related to public health, the education system, social inequality, and population well-being. The program is supported jointly by the Annenberg Institute, the Brown University Economics Department, and the Population Studies and Training Center.
The URF program is structured in two phases. The first phase is a two-week “bootcamp” that covers skills in coding, data management, research design, and statistical analysis. Students will engage in hands-on learning opportunities using Stata, a statistical software package that is widely used in social science research. The second phase is a six-week research internship that pairs each student with a Brown faculty member in one of the social sciences: Education, Economics, Sociology, Political Science, or other relevant departments. Students will gain firsthand experience with the process of conducting empirical research.
Our approach emphasizes mentorship and peer learning, encouraging fellows to develop student and faculty relationships that may continue through the rest of their time at Brown. During the program, fellows also attend workshops and panels that introduce them to cutting edge research techniques and career paths both inside and outside of academia.

Students who participate in the URF program will…
1. Develop coding and analysis skills using Stata, a statistical software package that is widely used in social science research.
2. Learn to operate as an effective member of a research team.
3. Build community and connection across different fields and disciplines within Brown University.
Completion of this program will support fellows’ transition to related graduate school programs and/or professions in social science and public policy research.

Required qualifications: The URF program is open to Brown undergraduate students who are currently in their first, second, or third year of study. Undergraduates from all concentrations and backgrounds are welcome to apply. Applicants should have a strong interest in social science and public policy and the motivation to pursue research opportunities during their time at Brown.
Fellows must have completed at least one introductory statistics course (EDUC 1110, SOC 1100, CLPS 0900, APMA 1650, ECON 1620 or equivalent) before the program begins. Fellows must also be able to commit to the entire 8-week, full-time, in-person training program (May 26 - July 17, 2026) with general availability on weekdays from 9 AM to 5 PM. Time off can be accommodated within reason but must be communicated in advance. We will not have program activities on Juneteenth or Independence Day.

Preferred qualifications: Previous coding experience (e.g., Stata, R, Python) is welcome but not required.

Modality: In person

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: Available for 10 weeks beginning no later than June 8, and for some early evenings and weekends.

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

Modality: In person

Is this project for more than one student: No

Ruth Colwill
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Improving the effectiveness of teaching observation programs

Project Description:
Teaching observations are intended to be a developmental tool to enhance instructor efficacy and improve student learning; however, peer observations can often feel like a compliance exercise to both the observer and observed with limited evidence of impact on teaching and learning. Observation programs differ widely—they may be institutionally mandated or departmentally autonomous; they may be developmental or evaluative in purpose; they may involve peer or hierarchical observations; they may be conducted by an observer with expertise in teaching and learning or not. These differences influence the value of peer observation programs and are worthy of closer study. This study aims to identify the characteristics of an effective teaching observation program and the reasons why some programs are discontinued.

The UTRA student will help finalize a review of the teaching observations literature, participate in the design of a survey to assess observers' and observed teachers' experiences and satisfaction with teaching observations, collect pilot survey data, conduct interviews and focus groups, and analyze responses. The results will be used to develop and assess best practices for a teaching observation program. By the end of this project, the UTRA student will be able to describe the key findings of the teaching observations literature, design a rigorous and unbiased survey, conduct interviews and focus

groups, code responses, perform statistical analysis, and draw conclusions from the data. Interested students are invited to email ruth_colwill@brown.edu and kristi_kaeppel@brown.edu for more information about the study.

Required qualifications: Students must have an interest in teaching and learning.

Preferred qualifications: Excel and/or other computer skills; survey development; strong writing skills.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Kareen Coulombe
Department: Engineering, Medical Science
Project Type: Research
Project Title: Engineering Microvascular Networks for Regenerating the Heart

Project Description:
Heart attack patients who survive the initial injury have reduced blood flow to the injured region of the heart, and no therapy exists for regenerating the smallest vessels needed to supply the heart. This research project aims to advance our therapeutic capabilities using biomaterials and vascular cells derived from human induced pluripotent stem cells (hiPSCs) to build, perfuse, and grow new vessels in vitro and in vivo to improve heart function. Skills taught will include biomaterial fabrication, cell culture of hiPSCs and their differentiated progeny, tissue engineering, experiment design, data collection, immunohistochemistry/ histology, imaging and analyses, record keeping, statistical analyses, and communication of results. Close mentorship in the lab will be provided by a senior PhD student and Dr. Coulombe for an immersive, collaborative learning experience in hands-on research with increasing development of student independence. This project will contribute to our ongoing NIH-funded research to regenerate the vasculature and musculature of the infarcted heart.

Required qualifications: Reading the literature, at least one lab course completed at Brown, trained in the Brown Design Workshop in SOE

Preferred qualifications: Pipetting, completed a lab course at Brown, some coding experience

Modality: In person

Is this project for more than one student: No

Christina Cuomo
Department: Molecular Microbiology and Immunology
Project Type: Research
Project Title: Genetic mechanisms of antifungal resistance in Candida auris

Project Description:
Candida auris is a human pathogenic yeast species that infects immunocompromised individuals in healthcare settings, often causing invasive and life-threatening disease. Of particular concern to clinicians are the high levels of resistance C. auris isolates exhibit to every major class of antifungal drug, making it a difficult pathogen to treat. The Cuomo Lab is interested in understanding and characterizing how specific genes in C. auris are involved in antifungal drug resistance. We use CRISPR-Cas9 gene editing to study the potential role that specific genes play in resistance. This is a multi-step process, involving several molecular biology protocols in the lab prior to work with C. auris itself, from CRISPR-Cas9 guide RNA and repair template design to plasmid sub-cloning and E. coli transformation. A UTRA summer student would be responsible for these experiments under the supervision of a postdoctoral researcher. Some specific tasks the student would complete include: restriction enzyme digests, PCR, DNA ligation, and bacterial transformations. This project will give the student the opportunity to develop fundamental microbiology/molecular biology laboratory skills, including sterile/aseptic technique, cell culturing, and DNA cloning. They will also gain skills specific to CRISPR-Cas9 gene editing such as design and preparation of guide RNA and repair template DNA, and preparation of CRISPR-Cas9 plasmids for fungal transformations.

Required qualifications: Our expectations are the student will have curiosity and interest in the research project, a willingness to learn, an ability to work both independently and as part of a team, and introductory coursework in biology/genetics.

Preferred qualifications: Basic laboratory skills/familiarity (e.g., pipetting, measuring chemicals, making solutions/reagents, etc.).

Modality: In person

Is this project for more than one student: No

Grace Cushman
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Developing Behavioral Health Interventions to Improve Food Allergy Management

Project Description:
The main objective is to develop behavioral health-focused interventions to prevent the onset of food allergies and improve management of diagnosed food allergies across child developmental stages. We will use quantitative and qualitative methods to create the interventions and modify them based on feedback from families. Students will have an opportunity to 1) recruit eligible families through phone, email, or on-site, 2) help with drafting intervention materials, 3) assist with running focus groups of participants, and 4) assist with quantitative and qualitative analyses and preparation of study results.

Required qualifications: N/A

Preferred qualifications: Students should have an interest in behavioral health-focused interventions, motivation to work with families from a variety of backgrounds, and a desire to learn more about research

processes involving youth and families.

Modality: In person

Is this project for more than one student: No

Colleen Dalton
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Imaging magma distribution under volcanoes using seismic waves

Project Description:
Volcanic eruptions connect the Earth's deep interior with its surface and atmosphere, and they have effects ranging from natural hazards to geothermal energy to climate. Therefore, there is a need to understand how magma forms, ascends to the surface, and erupts. This project will make progress toward understanding how and where magma is currently being stored in the deep crust under a recently active volcano. The project will determine the speed of seismic waves, which were generated by distant earthquakes, as they travel beneath the volcano. The speed of seismic waves is sensitive to the abundance of magma and whether it is stored in flat horizontal layers or tall vertical columns.

As part of the project, you will download records of ground shaking made at seismograph stations distributed around the volcano. You will use, and possibly modify, computer programs to measure the travel times and amplitudes of the seismic waves. These measurements will be used to estimate 3-D variations in the seismic wave speed beneath the volcano, which can in turn be interpreted in terms of the distribution of magma.

You will gain experience working with seismic data, learn about magma plumbing beneath volcanoes, and become more familiar with using and writing computer code. You will read published research articles to gain a broader context for the project and results. You will have opportunities to interact with the rest of my research group, including participating in our weekly group meeting. You will be encouraged to present your work in a poster at the Brown Summer Research Symposium.

Required qualifications: Basic computer skills, interest in analyzing data using computer codes, and a willingness to learn programming. A willingness to ask questions and think critically. An interest in Earth and Planetary Sciences.

Preferred qualifications: Some experience with coding, including languages such as Python or MatLab. Some familiarity with Earth science, which could include a course (for example EEPS 0220) or other background.

Modality: In person

Is this project for more than one student: No

Ian Dell'Antonio
Department: Physics
Project Type: Research
Project Title: Measuring the infrared emission from galaxy clusters

Project Description:
In this project, the students will measure the infrared luminosity of galaxies in nearby clusters using data from the NEOWise Satellite (and, where available, the Spitzer Space Telescope). By comparing the infrared emission to the optical measurements our group has already made, the students will be able to measure the amount of dust in the galaxies and test whether the dust within the galaxies can survive in the cluster environment. Then, the students will use the emission across different wavelengths to build a model of the star formation history of the cluster galaxies.

Required qualifications: The research will require the use of python, so some familiarity with python (either through a course or prior experience on a project) is required.

Preferred qualifications: Some experience with astronomy (at the level of PHYS0270) is preferred, but not required. Familiarity with linux and astronomical databases is again preferred but not required.

Modality: In person

Is this project for more than one student: Yes

Ian Dell'Antonio
Department: Physics
Project Type: Research
Project Title: Diffuse Halos of Galaxies and the Intra-Cluster Light

Project Description:
Galaxies in clusters live in a crowded environment, and are subject to larger tidal forces than galaxies that are isolated. This should have an effect on their outer stellar envelopes. In this project, students will be measuring the radial distribution of starlight in galaxies in clusters (and foreground galaxies seen in projection in the same direction) to determine whether the outer envelope of stars is still present in the cluster galaxies. Students will be using the Galapagos2 software package to measure the light distribution within the galaxies and compare the extent of the galaxies in the different environments. For galaxies near the cluster center, the students will also be able to search for strong gravitational lensing by subtracting the model profiles from the data to look for arcs and multiply lensed background quasars.

Required qualifications: The project requires some background knowledge in astronomy at the level of PHYS0220 or PHYS0270.

Preferred qualifications: Experience with linux and astronomical software is preferred but NOT required.

Modality: In person

Is this project for more than one student: Yes

Kyle Denison Martin
Department: Emergency Medicine, Institute at Brown for Environment and Society (IBES), Medical Science
Project Type: Research
Project Title: Trauma Training Sessions at District Hospitals in Rwanda

Project Description:
This project involves collaborating with a team of researchers from Brown University and the University of Rwanda to provide trainings on trauma care at district hospitals throughout Rwanda. The project is a part of a nationwide effort to build capacity in emergency care. Students will be responsible for assisting with logistical planning for sessions. They will also be responsible for entering data from pre- and post-training KAP (knowledge, attitude, practice) surveys into a shared spreadsheet. Students may also volunteer to serve as simulated patients during training sessions (optional). It is expected that students who participate in this opportunity travel to Rwanda for two weeks in late May/early June 2026.

Required qualifications: N/A

Preferred qualifications: Interest in pursuing a career in medicine, EMT training, previous international travel

Modality: In person

Is this project for more than one student: Yes

Kyle Denison Martin
Department: Emergency Medicine, Institute at Brown for Environment and Society (IBES), Medicine
Project Type: Research
Project Title: Creation of Patient Discharge Instructions on Extreme Weather & Environmental Exposures

Project Description:
This project involves the creation of patient discharge instructions for health providers that are focused on extreme weather and environmental exposures. The selected student will assist in categorising and mapping existing topics for discharge instructions. They will then aid in identifying topics to be developed into new patient discharge instructions. These discharge instructions will then be piloted at healthcare facilities (including primary care offices and local emergency departments).

Required qualifications: N/A

Preferred qualifications: Background in communications/journalism, interest in climate & health

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Phyllis Dennery
Department: Molecular Biology, Cell Biology, and Biochemistry, Pediatrics
Project Type: Research
Project Title: Computational and molecular approaches to understanding developmental senescence

Project Description:
Our laboratory investigates lung injury in the premature lung using a clinically relevant model in mice and other species. Using tissue samples or cell lysates as well as paraffin embedded slides subjected to Western blotting, PCR and Immunohistochemistry, lung samples will be evaluated at different points in gestation for evidence of cellular senescence and compared to tissues exposed to hyperoxia (100% oxygen) or mechanical ventilation. In addition, single cell RNA seq data from existing repositories will be interrogated for the presence of genes important in senescence and metabolism. This will involve gaining an understanding of common computational biology approaches. By the end of the summer, the student should have learned various laboratory techniques, begun to do some data analysis and, if successful, written an abstract that would be submitted to a regional or national meeting. Interested students can reach out to me identifying that they are applying for the summer UTRA.

Required qualifications: students with some laboratory experience are preferred. Students with some knowledge of computational biology are also preferred.

Preferred qualifications: Basic laboratory skills such as Western Blotting, protein extraction and quantitation.

Modality: In person

Is this project for more than one student: Yes

Kevin Escudero
Department: American Studies, Annenberg Institute, Sociology, Population Studies and Training Center
Project Type: Research
Project Title: "Education, Not Deportation": Immigrant Graduate and Professional Students' Educational Trajectories

Project Description:
The Immigrant Student Research Project (ISRP) Lab seeks to examine immigrant legal status' effects on immigrant graduate and professional student experiences in higher education and during their transition into the U.S. workforce. Professor Escudero, the Lab's Director, and members of the research team are currently in the process of launching a national online survey of undocumented/DACAmented,

international, and U.S. citizen students (with immigrant parents) enrolled in such programs. At the completion of the survey, participants will be invited to participate in a follow up Zoom interview where they will be able to expand on topics/themes covered in the survey. During summer 2026, the selected student research assistants will work alongside other ISRP Lab members to analyze the survey data and conduct Zoom interviews with respondents.

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 experience working with immigrant communities locally or globally

3) Prior training in the use of quantitative (e.g. survey) and/or qualitative (e.g. in-depth interviewing) research methods

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

JiJi Fan
Department: Physics
Project Type: Research
Project Title: The Juno mission as a probe of new physics beyond the Standard Model of particle physics

Project Description:
Jupiter, the largest planet in our solar system, with a stable and strong magnetic field, has attracted a lot of exploration and studies. The latest Juno mission stands out for its broad spatial coverage, ranging from approximately 3000 kilometers to Jupiter at its closest point to millions of kilometers at its furthest approaches. The wide span of its trajectory, combined with its extended mission duration, has allowed Juno to gather a wealth of data, offering invaluable insights into the planet's structure and magnetosphere. In addition to its significant contribution to planetary science, the Juno data could have some unexpected applications to probe and constrain new physics beyond the Standard Model (SM) of particle physics. Prof. Fan and her term have applied the Juno data to constrain light dark matter particles (https://arxiv.org/abs/2207.13709), our photon mass as well as dark photon scenario (https://arxiv.org/pdf/2312.06746), and new long range forces (https://arxiv.org/pdf/2409.10616). In this summer project, the students will be following the same approach to apply the Juno data to constrain some new physics scenario, such as theories with light (pseudo-)scalars that interacts with the photon. The students will need to learn and understand the physics background of the scenario to be probed, implement the data analysis, and set constraints on the parameter space of the new physics scenario.

Required qualifications: Students are expected to have very solid backgrounds in physics and math (with mostly A's in physics and math courses taken). They are expected to take two semesters of quantum mechanics. In addition, students should have some data analysis skills and could code in Python/C++.

Preferred qualifications: Students are expected to have very strong self-learning capabilities and could learn some basics of advanced physics topics, such as quantum field theory and particle physics mostly on their own with some guidance.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Paja Faudree
Department: Anthropology, Linguistics
Project Type: Course Development
Project Title: "The Meanings of Merit: Labor, Categories of Difference, and the Creation of Knowledge"

Project Description:
I seek a student interested in collaborating with me to organize readings and screenings, identify guest speakers, and make decisions about other aspects of next year's Pembroke Seminar, which I will lead. The Pembroke Seminar is a unique learning and research community comprising an intergenerational group of scholars — undergraduates, graduate students, postdoctoral fellows, faculty, visiting scholars, and guests — who together pursue a set of critical questions in weekly meetings over the course of a year. The theme for next year will be "The Meanings of Merit: Labor, Categories of Difference, and the Creation of Knowledge"

Debates about the meaning of "merit" have intensified dramatically in recent years. The aggressive push at the national level to dismantle DEI initiatives and return to more "merit-based" decision making has disrupted policies across private and public sectors alike. Presented as an objective criterion for everything from hiring to admissions practices, event programming to publication review to the allocation of funding, merit is claimed as a neutral principle and used to challenge efforts to highlight and redress systemic and historical inequities surrounding the production of knowledge and the recognition of expertise. The contemporary discourse of merit frames the achievements of people whose recognition is marked by any association with diversity and inclusion initiatives as illegitimate. In light of these developments, it is more important than ever to produce and attend to work that insists on examining the ideological assumptions and historical contexts surrounding assertions of merit and fantasies of "excellence."

A fuller description of next year's Pembroke Seminar can be found here:
https://pembroke.brown.edu/pembroke-seminar/future

Required qualifications: There are no required qualifications other than the ability to work independently and curiosity about and commitment to the work we will do together.

Preferred qualifications: Experience in coursework or research related to the theme is preferable.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Paja Faudree
Department: Anthropology, Literary Arts
Project Type: Research
Project Title: Xolotl: Stories and Poems from MexiMerica

Project Description:
I seek a student to collaborate with me on research involving a literary writing project entitled "Xolotl: Stories and Poems from Meximerica." This work explores the dense entanglements of the US and Mexico through stories and poems that engage with the lives of people living on both sides of the border. The project will consist primarily of researching source material and conducting literature searches to find existing work related to my project. It will also involve researching publication venues and assisting with submitting work for publication.

Required qualifications: There are no requirements other than the ability to work independently, interest in the topic, and a commitment and curiosity about the work we will do together.

Preferred qualifications: Preference will be given to students with some experience and/or coursework involving literary writing and publication as well as students with knowledge of Mexico and fluency in Spanish.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Nicolas Fawzi
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Characterizing biophysical properties of synthetic repeat domains in RNA-binding proteins

Project Description:
This project investigates how different engineered versions of the protein Fused in Sarcoma (FUS) influence liquid-liquid phase separation (LLPS), a process where proteins form dynamic, droplet-like compartments inside cells. Mutations in FUS, which promote protein aggregation, are linked to neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS). By studying how variations in the sequence and structure of FUS's low-complexity (LC) region affect LLPS and aggregation, we aim to better understand the molecular "rules" that govern FUS behavior and its connection to disease.
The focus of the work is on six synthetic variants of the FUS LC region, which will be compared to the wild-type (WT) protein. The student will first develop and optimize methods for purifying these aggregation-prone proteins in high concentrations, particularly by refining immobilized metal affinity chromatography (IMAC) techniques. This hands-on work includes adjusting buffer conditions and purification steps to minimize protein loss and improve yield.

Once purified proteins are obtained, the student will analyze phase behavior using both microscopy and biochemical assays. Microscopy will allow visualization of protein droplets and their changes over time, providing insight into how quickly each construct transitions from liquid to solid states. In parallel, the thioflavin T (ThT) assay will be used to measure amyloid fibril formation, helping determine whether protein aggregates are amyloid in structure and how rapidly they form.
Through this project, the student will gain direct experience with protein purification, microscopy, and fluorescence assays while contributing to a larger effort to unravel how sequence composition influences protein phase separation. The results will deepen our understanding of FUS biology and may inform strategies for therapeutic intervention in neurodegenerative disease.

Required qualifications: Intended concentration in Biochemistry or a related field

Preferred qualifications: BIOL 0280 and BIOL 0285 to provide theoretical and practical background for this opportunity. Strong preference for completion of BIOL1300 and/or BIOL1270 course that provides helpful background for this project.
Prior experience with quantitative analysis tools and presentation tools.
time management skills and demonstrated ability with troubleshooting and analytical skills

Modality: In person

Is this project for more than one student: No

Roman Feiman
Department: Cognitive and Psychological Sciences, Linguistics
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.

Students in the lab will help recruit and test participants, construct experimental stimuli, process and code data (audio, transcripts, etc.), and conduct literature searches and reviews. Interested students will also have opportunities to get involved with experimental design, data analysis, scientific writing, and

presentation skills. Students will have the opportunity to attend weekly lab meetings to learn about cutting-edge research going on in the lab and regular meetings with senior research personnel in the lab (grad students, postdocs, and Prof. Feiman).

Required qualifications: Strong organizational skills, attention to detail, ability to work independently. Experience with or desire to work with children.
Proficiency with Word, Excel, Powerpoint, Google platforms.

Preferred qualifications: Prior experience working in a lab or 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.

Modality: In person

Is this project for more than one student: Yes

Kim Fernandes
Department: Anthropology, Data Science Institute, Institute at Brown for Environment and Society (IBES), Science, Technology, and Society
Project Type: Research
Project Title: Measuring Disability Globally: Similarities and Differences Across Contexts

Project Description:
What kinds of measures do states rely on when they look to understand the prevalence of disability among the population? How do these measures vary among different states, and what overlap exists in the measures that states tend to rely upon? This research project seeks to explore how disability is measured across a range of countries globally, paying attention to the various forms in which it is recorded - whether as a percentage, a diagnosis, or in another form. In doing so, the project hopes to outline how disability is seen - both similarly and differently - across global contexts, and to attend to some of the origins and organizing logics of disability measurement measures. Additionally, the project is concerned with the policy implications of these varied disability measurement measures, with a specific focus on the impacts that measuring disability can - and does - have on the everyday lives of people. The project is designed such that students will have the opportunity to develop archival and other related qualitative research skills. It is best suited for those who are interested in questions of disability and/or data, and want to hone their research skills by working with both primary and secondary sources. In addition to weekly meetings, the project will leave room to learn skills essential to various stages of a research project, such as synthesizing literature and organizing sources. More about the research interests that motivate this project and others that I am leading can be found at kimfernandes.com.

Required qualifications: Required qualifications: an interest in archival research and/or past coursework in history, an interest in (or experience working on topics related to) disability. Please submit a short writing sample (5 - 10 pages) on any topic, as an example of research that you have worked on in the past.

Preferred qualifications: Preferred qualifications: prior archival experience, experience in contexts outside that of the US

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Rick Fleeter
Department: Engineering
Project Type: Research
Project Title: Living the Good Life - In Space

Project Description:
The UTRA program has generously supported several human centric space research projects including restorative games, human centric space architecture, a multi purpose space facility, advanced space suits, the Virtual Astronaut and advanced exercise techniques including neuromuscular electrical stimulation. Every one of these projects has not only sponsored a student, but been the core around which a larger group of student researchers has assembled. Several of the programs have continued beyond the UTRA with alternative funding sources and multiple years of student participation.

This experience led me to question - what do they all add up to? Is there a central question common to all of them? The title of this proposal is my answer - we are all about making the human experience in space better - safer, more comfortable, more and better accommodations, less degeneration of the human body, The overarching goal is to change space from a challenging environment for highly skilled and motivated astronauts, to a place people from all walks of life, of all ages and income levels, want to go to for the enjoyment of it, the inspiration and the education Because it improves their lives.

What would change human space from a challenge to a delight. If space right now is analogous to a geologist living in a tent in Antarctica, how to convert that to overwintering in a Swiss Alpine village. We will attempt to define a potential life in space that is a delight, to then ask - what do we not have right now, that we must create, to realize that fantasy? That wide open design exercise and its resulting wish list, tempered by the engineering art of the do-able, i.e. we are not talking about science fiction, though it can inspire us, is this project.

As has happened in the past, the core of 1 awarded student, <I hope to supplement with students from other disciplines to get a wide range of diverse opinions and suggestions on the creation of a nearly utopia existence in space. That might include political and leadership ideas, aesthetics and art, as well as architecture, food and other cultural elements, which form the vision which engineering strives to fulfill.

Required qualifications: Familiarity, interest and experience in some aspect of human space

Study, work and leisure activities indicating interest and ability in both engineering / tech and humanities including aesthetics, politics, policy law and economics,

Preferred qualifications: interest and experience in how humans might live in the future - on earth or in space. For instance new ways to do agriculture in the future, potential new forms of medicine, new political structures for living on the moon and mars, as examples

experience forming, working in and leading a diverse group. The UTRA awarded student cannot possibly span all the possible areas of interest in creating a good life in space. That student will recruit and manage such a group to ensure the widest possible range of ideas surrounding the research goal.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Hannah Frank
Department: Psychiatry and Human Behavior
Project Type: Research
Project Title: Project REACH (Raising Exposure Awareness for Caregiver Help-Seeking) [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
This project is focused on helping families of children with anxiety learn about and access exposure therapy, a highly effective but often underused treatment. We are developing a set of resources (such as infographics, short scripts, and caregiver stories) designed to make it easier for parents and caregivers to understand what exposure therapy is, why it works, and how to find it. These materials are being created with direct input from community members, including parents, teachers, and health professionals, and then tested via an online survey with families to see if they make a difference in caregivers' motivation and confidence to seek treatment.

As a student on this project, you will learn how to process and analyze qualitative feedback from caregivers. You may have the opportunity to attend community advisory board meetings. You will also support the online pilot study, which will involve helping manage surveys and contributing to data analysis and interpretation. Through these activities, you'll gain hands-on experience with community-engaged research, qualitative methods (like data processing and analysis), and quantitative methods (like survey design and data management). You'll also learn how research teams translate ideas into practical tools that can make a real impact on families' access to care.

By joining this project, you'll be contributing to work that aims to reduce barriers to mental health treatment for youth and their families. Students are also invited to attend lab meetings to get a broader sense of the team's work and ongoing projects. More information about our group is available at the BRIDGE Program website:
https://psych.med.brown.edu/research/research-core-facilities-and-resources/BRIDGE.

Required qualifications: Strong interest in mental health, psychology, public health, or related fields
Successful completion of at least one research-focused or methods-oriented course (e.g., psychology research methods, public health methods, statistics, qualitative research)
Basic computer skills (e.g., Microsoft Word/Excel, Google Suite); willingness to learn new software for data collection and analysis
Strong written and verbal communication skills, with attention to detail
Ability to work independently, stay organized, and manage tasks on a timeline
Comfort working with sensitive topics related to youth and family mental health
Openness to learning and contributing in a collaborative team environment

Preferred qualifications: Prior experience with research (course projects, independent study, or lab work)
Experience with qualitative methods (e.g., conducting or coding interviews, focus groups) or quantitative methods (e.g., surveys, data analysis)
Familiarity with mental health concepts, child/adolescent development, or community-based research

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Mara Freilich
Department: Earth, Environmental and Planetary Sciences, Applied Mathematics
Project Type: Research
Project Title: Community Science for Environmental Justice [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Community science is a valuable method for collaboration between environmental justice communities and academic scientists in a way that allows communities to direct the questions, goals, and outcomes of research. Environmental justice concerns are multidimensional and interdisciplinary. Our research focuses on the intersection between infrastructure, water quality, and air quality in two locations. Communities around the Salton Sea in Southern California face poor air quality due in part to dust and odors emanating from the Salton Sea. The Salton Sea Environmental Timeseries (SSET) is a community science project focused on community impacts as the Salton Sea declines. In Providence, RI, pollution from industries and sewer infrastructure impacts the upper Narragansett Bay. Research on this project includes ecology, biogeochemistry, geography, public health, and physical oceanography/limnology. The exact project is flexible depending on the interests of the student, but could include analysis of water quality data collected as part of the community science work, new data collection, developing a computer-based models of biogeochemistry, or synthesizing survey and interview data with physical science results. For all projects, data and results will be developed in close collaboration with community scientists and organizers to be used in advocacy for improved water quality and air quality.

Required qualifications: ability to communicate across disciplinary divides and with diverse communities

Preferred qualifications: programming experience or interest

Modality: In person

Is this project for more than one student: Yes

Mara Freilich
Department: Earth, Environmental and Planetary Sciences, Applied Mathematics
Project Type: Research

Project Title: **Exploring the Fate of Organic Carbon in the Gulf of Guinea**

Project Description:
Coastal ecosystems are among the most productive ocean environments and support economically vital industries such as fisheries. In the Gulf of Guinea, artisanal fisheries rely on coastal productivity. Yet key components of their carbon cycle, in particular how carbon is transformed and transported offshore, remains poorly constrained. This project focuses on cross-shelf exchange, an important pathway for carbon transport that is not represented in global ocean models. Understanding cross-shelf carbon exchange improves regional carbon-budget assessments and improves our ability to predict how coastal ecosystems will respond to climate variability. The focus will be on the Gulf of Guinea, a highly productive, understudied upwelling system, where the fate and distribution of carbon is almost entirely unconstrained. The overall goal of this research project is therefore to identify production, consumption, and transport of carbon in the coastal ocean. Depending on interest, the student may also analyze biological community composition data as part of understanding the broader ecological setting. This project will involve the use of computer programming (in MATLAB, R and/or Python) to analyze output from an idealized ocean model and/or observations from oceanographic field campaigns. This project is therefore suitable for students with a wide range of interests and skills from biogeochemistry to engineering to applied math, but students with programming knowledge or interest are preferred. There are opportunities to tailor the project based upon the interests of the student and there may be opportunities for fieldwork.

Required qualifications: N/A

Preferred qualifications: Knowledge or interest in MATLAB, R, and/or Python

Modality: In person

Is this project for more than one student: No

Jessica Fremland
Department: American Studies
Project Type: Research
Project Title: **Into the Depths of Inclusion: Cultural Safety, Care Networks, and Resources for Indigenous Artists, Storytellers, and Creatives [This project is cross-listed with the Brown Laidlaw Scholars Program.]**

Project Description:
Professor Fremland is seeking a research assistant to work with her and community partner, Indigenous Performance Productions (IPP) on the second half of a research project begun last summer to understand the position of Indigenous performing artists (in a variety of fields including dance, music, theater, etc.) and their intercultural experiences of touring, cultural safety, and goals within their field. The UTRA will assist in the organization and collection of any remaining ethnographic research pertaining to this community-engaged research project This project focuses on the The summer project follows up on the collection of survey data from approximately 45 Indigenous artists from across North America gauging broad experiences and resource needs. Throughout the summer the UTRA and Professor Fremland will finish any remaining interviews and the UTRA will help to transcribe these interviews. The UTRA will also receive credit for their work in an independent publication with Indigenous Performance Productions. This

data is being collected with the goal of increasing resources and safety for Indigenous performers in creative spaces. Both the quantitative and qualitative data will be used as the foundation for IPP to develop a useful online resource center for Indigenous performers.

Required qualifications: Basic experience with applications such as Zoom, Word, and Excel. Listening, organizational and communications skills.

Preferred qualifications: Past research experience/course especially with interviewing. I will also give some training on this, especially as it pertains to interviewing in Indigenous communities.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Jessica Fremland
Department: American Studies
Project Type: Course Development
Project Title: Storying Escape: Native American Boarding School Histories on Screen

Project Description:
Professor Fremland is seeking an UTRA to assist in the development of a First Year Seminar titled, Storying Escape: Native American Boarding School Histories on Screen. This course introduces students to the history of Native American boarding schools through a series of modules that pair theoretical and historical texts with media representations. The UTRA(s) assigned to this project will help find media representations in the form of documentaries, short and experimental films, television, and/or cinema that focus on telling stories about the imprisonment of Native American children in boarding schools in the United States from the late 19th to 20th centuries. The UTRA(s) will watch these films alongside several readings and prepare synopses describing content and impact of the media, especially considering how it deals with trauma and what Geral Vizenor calls, survivance. Throughout the summer we will meet to discuss the films and/or readings and their possible contributions to the syllabus. Students will also work with Professor Fremland to develop discussion guides and experiment with curriculum development such as creating and practicing decompression activities.

Required qualifications: Basic experience with applications such as Zoom, Word, and Excel. Listening and communications skills.

Preferred qualifications: Knowledge in the field of Native American/Indigenous Studies, especially concerning the history of boarding schools in the US.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Shailja Gangrade
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Investigating Physical and Ecological Controls on Phytoplankton Communities

Project Description:
Phytoplankton, photosynthetic unicellular organisms, form the base of aquatic food webs. The distribution of these organisms is regulated by light and nutrient conditions, which often vary with water turbidity conditions and runoff of land-based chemicals. Also, during photosynthesis, phytoplankton generate oxygen and take up carbon dioxide, serving a critical function in global oxygen and carbon cycles. Therefore, identifying the composition of phytoplankton communities (who's there?) and the distribution of phytoplankton biomass (where are they?) both vertically and horizontally is key to understanding how aquatic ecosystems might respond to climate change. This project will involve the use of computer programming (in MATLAB, R, and/or Python) to process phytoplankton-related data (chlorophyll pigment and/or DNA sequencing data sets). The student will have the opportunity to analyze data collected from either the Rhode Island Narragansett Bay or the California coastal ocean. There is potential opportunity for the student to assist with water sampling and laboratory processing. This project is therefore suitable for students with a wide range of interests and skills from genomics to applied math, but students with programming knowledge or interest are preferred. This project will involve working closely with Dr. Shailja Gangrade and the laboratory group of Prof. Mara Freilich, and there are opportunities to tailor the project based upon the interests of the student.

Required qualifications: N/A

Preferred qualifications: Knowledge or interest in MATLAB, R, or Python

Modality: In person

Is this project for more than one student: No

Alicia Genisca
Department: Emergency Medicine, Pediatrics
Project Type: Research
Project Title: Effect of Gastrointestinal Treatment of Ebola Virus Disease

Project Description:
This project seeks to identify effective treatments for Ebola Virus Disease (EVD), which has one of the highest mortality rates of any human disease. Despite advancements in EVD care, there are substantial gaps in research on supportive treatments, particularly those targeting the gastrointestinal system. Utilizing a previously collected dataset from an EVD outbreaks in West Africa (2014-2016) and the Democratic Republic of Congo (2018-2020), this research aims to evaluate whether three readily available medications, including omeprazole, metronidazole, and albendazole, can reduce deaths in patients with EVD.
The student will work closely with the PI (at Brown) and collaborators from W. Africa and Democratic Republic of Congo (remotely). The student will help to organize and analyze the dataset, create summary tables and figures, and contribute to a manuscript suitable for submission to a scientific journal. No prior

experience with clinical research is required.
Student responsibilities may include:

- Conducting a literature review and synthesizing publications to help frame the study
- Assisting with data cleaning and variable construction
- Conducting descriptive and exploratory data analyses
- Creating tables and visualizations for internal use and for publication
- Supporting preparation of abstracts or manuscript sections

Required qualifications:

- Strong organizational skills
- Interest in global health, children's health, emergency care, or infectious diseases
- Experience with Microsoft Excel
- Willingness to learn new analytical tools and research methods

Preferred qualifications:

- Prior experience with statistical software (Stata, R, or Python)
- Coursework in epidemiology, biostatistics, or data science
- Experience working with datasets of any kind

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Alicia Gensica
Department: Emergency Medicine, Pediatrics
Project Type: Research
Project Title: Assessing the Impact of Fluid Administration on Sepsis Severity Among Pediatric Patients in Dhaka, Bangladesh

Project Description:
Project Description:
Early fluid administration is a cornerstone of pediatric sepsis care, but the optimal amount and timing of fluids—particularly in low-resource settings and amongst patients with malnutrition—remains an area of uncertainty. Too much fluid may worsen breathing or cardiac function, while too little can delay recovery and contribute to worsening illness. Understanding how different fluid administration strategies influence the clinical course in children could be key to improving outcomes.
This project uses previously collected clinical data from children with sepsis admitted to the ICU of a large hospital in Dhaka, Bangladesh. The goal of this study is to describe how fluids were given and explore how different patterns of fluid administration are linked to markers of illness severity.
The student will work closely with the PI (at Brown) and collaborators from Bangladesh (remotely). The student will help to organize and analyze the dataset, create summary tables and figures, and contribute to a manuscript suitable for submission to a scientific journal. No prior experience with clinical research is required.
Student responsibilities may include:

- Conducting a literature review and synthesizing publications to help frame the study
- Assisting with data cleaning and variable construction

- Conducting descriptive and exploratory data analyses
- Creating tables and visualizations for internal use and for publication
- Supporting preparation of abstracts or manuscript sections

Required qualifications:
- Strong organizational skills
- Interest in global health, children's health, emergency care, or infectious diseases
- Experience with Microsoft Excel
- Willingness to learn new analytical tools and research methods

Preferred qualifications:
- Prior experience with statistical software (Stata, R, or Python)
- Coursework in epidemiology, biostatistics, or data science
- Experience working with datasets of any kind

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Loukas Gouskos
Department: Physics
Project Type: Research
Project Title: Ultra-Fast AI and Detector Design for the Next Generation Particle Colliders

Project Description:
The next generation of particle colliders, such as the proposed Future Circular Collider (FCC) at the European Organization for Nuclear Research (CERN; Geneva-Switzerland), will demand detectors and electronics that can process enormous data rates in real time, with extremely tight constraints on power, latency, and bandwidth. This UTRA project will place the student at the interface of particle physics, detector design, and hardware-aware AI. The goal is to explore how ultra-efficient AI algorithms and detector configurations can enhance the measurement of Higgs couplings and other key physics observables at future colliders.
The work will be organized in three tightly connected projects: (a) developing and studying ultra–low-power AI models for on-detector ASICs place on the silicon sensors; (b) designing and benchmarking ultra-fast AI algorithms for FPGA-based trigger systems, with a focus on meeting strict sub-microsecond latency; and (c) performing detector-design and configuration studies with fast simulations, varying key parameters of the vertexing and timing systems and assessing their impact on physics metrics such as flavor tagging and Higgs coupling precision. Throughout the summer, the student will be based at CERN and work with real simulation and synthesis tools, and have the unique opportunity to interact regularly with collaborators at CERN and present their findings at FCC public meetings.

Required qualifications: Strong knowledge of Python and C++, Strong knowledge of AI/ML particularly (Variational) Autoencoders, Graph Neural Networks, Transformer models. For projects (a) and (b) good knowledge of High-Level Synthesis is required. For project (c) knowledge of particle physics and interest in detector R&D is required.

Preferred qualifications: Excellent knowledge of Python and C++, Solid experience in developing AI/ML algorithms; For project (c) prior experience in detector R&D and data analysis.

Modality: In person

Is this project for more than one student: Yes

Loukas Gouskos
Department: Physics
Project Type: Research
Project Title: AI-Guided Optimization of Cyclotron Medical Isotope Production

Project Description:
This project will explore how AI and self-learning algorithms can optimize the production of medical isotopes in cyclotrons, with the long-term goal of improving yield, stability, and resource efficiency. The students will work with either real process data (when accessible) or detailed simulations of cyclotron irradiation and target response to learn how beam energy, current, target composition, cooling, and irradiation time jointly affect isotope yields and byproducts. Starting from a simplified supervised-learning/regression model to predict yield as a function of these parameters, the project will then move toward more advanced adaptive or self-learning strategies that can propose improved operating points and update themselves as new data are collected. Where licensing or access permits, simulations for a small set of isotopes will be used to test whether models trained on a subset can predict optimal conditions for other isotopes, probing generalization across reaction channels. Over the course of the project, the students will gain experience with nuclear-reaction–motivated modeling, data-driven optimization, and the design of AI systems that can be embedded into real experimental workflows in medical physics.

Required qualifications: Strong Python programming skills; good knowledge of machine learning (especially regression and supervised learning); Good knowledge with numerical methods and data analysis (e.g., NumPy, pandas, simple plotting)

Preferred qualifications: Experience with a major ML framework (e.g., PyTorch or TensorFlow); Prior exposure to optimization methods (e.g., Bayesian optimization or hyperparameter tuning); any background in nuclear physics, medical physics, or use of simulation tools (e.g., FLUKA)

Modality: In person

Is this project for more than one student: No

Roee Gutman
Department: Biostatistics
Project Type: Research
Project Title: Designing Statistical Software for Matching Algorithms

Project Description:
Matching is a statistical technique to identify comparable units across groups. Matched units are used to inform variables that are not observed in their counterparts. Existing matching approaches range from simple greedy algorithms to computationally intensive optimal procedures. Inference methods for matching algorithms have typically been tailored to specific applications (e.g. record linkage, causal inference, missing data), and the proliferation of matching algorithms has lacked a unifying framework. We developed a Bayesian framework for matching algorithms. These methods are based on Markov Chain Monte Carlo (MCMC) sampling, as well as other optimizing procedures. In this project we will implement statistical methods to provide statistically valid estimates within open-source software that will be available for researchers who want to rely on matching techniques.

Required qualifications: A programming course, statistical course that describes hypothesis testing and confidenc e intervals

Preferred qualifications: Knowldge of Bayesian Analysis, Knowldege of R

Modality: In person

Is this project for more than one student: No

Roee Gutman
Department: Biostatistics, Data Science Institute
Project Type: Research
Project Title: Designing Statistical Software for Secondary Data Analysis of Linked Datasets

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. 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 address 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: Course in programming, Course in Statistics

Preferred qualifications: Mixture models, Bayesian Analysis, Working with R

Modality: In person

Is this project for more than one student: No

Carolina Haass-Koffler
Department: Psychiatry and Human Behavior, Behavioral and Social Sciences, Neuroscience
Project Type: Research
Project Title: Clinical Trials in Addiction Medicine and Comorbidities

Project Description:
We conduct several FDA-regulated clinical trials involving patients with addictive disorders and comorbid conditions such as PTSD, obesity, and anxiety. Students will be involved in study logistics, assessments, data collection, and data entry. Training will also include exposure to IRB, FDA, and DEA regulatory processes.. The student will be involved in assessments, data collection, and shadowing the Study Physician, Resident and Nurse Practitioner on the floor. Responsibilities include also support to the clinical research staff in the logistics of the trials, data entry and presenting a research poster as part of the Brown Summer Sessions opportunities.

Required qualifications: Knowledge in pharmacology and completion of CITI training are required.

Preferred qualifications: Experience with biomedical procedures such as SCID training, EKG and phlebotomy is highly preferred.

Modality: In person

Is this project for more than one student: Yes

Jennifer Hadden
Department: Political Science, International and Public Affairs
Project Type: Research
Project Title: Power Shifts: Transnational Advocacy Networks and the Politics of Coal

Project Description:
I am looking for research assistants to support a project examining how transnational activist networks influence global energy politics, with a specific focus on the diffusion of anti-coal norms. This position is ideal for someone interested in social movements, climate politics, and qualitative or mixed-methods research.

The research assistants will be responsible for collecting, organizing, and coding data on international environmental organizations, campaigns, and policy developments related to coal phase-out efforts. Key tasks include compiling datasets from public reports, media archives, NGO publications, and international policy documents; conducting systematic searches; and maintaining clear documentation of all sources and methods. The role may also involve preliminary analysis, preparing research memos, and assisting with literature reviews.

Applicants should have strong research and organizational skills, attention to detail, and the ability to work independently while communicating effectively with the project team. Familiarity with social movement

theory, climate governance, or qualitative coding software (e.g., NVivo, Atlas.ti) is an asset but not required.

This position offers the opportunity to contribute to a timely project on activist influence in global energy transitions. Students in political science, IAPA, sociology, environmental studies, or related fields are especially encouraged to apply.

Required qualifications: There are no required qualifications. Please provide a link to a short writing sample along with your application.

Preferred qualifications: Familiarity with social movement theory, climate governance, or qualitative coding software (e.g., NVivo, Atlas.ti) is an asset but not required. Foreign language skills are also desirable but not required.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Johanna Hanink
Department: Classics, John Nicholas Brown Center for Advanced Study
Project Type: Research
Project Title: Brown's earliest curriculum: a thick description

Project Description:
This project seeks to develop a “thick description” of Brown University’s earliest curriculum, focusing on how students in the 18th century read, interpreted, and interacted with classical texts. The goal is to understand not only what students read, but how and why they read it: which editions and pedagogical aids (lexica, grammars, commentaries) they used, how paratexts (e.g. dedications and introductions) shaped their encounters with ancient authors, and how the intellectual and political environment of colonial North America informed their reading of the ancient authors.

The UTRA student will assist with archival research by examining early college catalogues, library records, student notebooks, and printed editions of course texts held at Brown and other New England institutions. They will help track which editions were used, identify reading aids and commentaries, and compile evidence on how classical learning was contextualized within broader Enlightenment debates about language, virtue, and “civilization.”

Students will gain hands-on experience in archival methods, historical bibliography, and the digital organization of research materials. They will also engage critically with questions about the history of higher education, colonial intellectual culture, and the transmission of the classical tradition.

Students with interests in Classics, History, Education, or Early American Studies are especially encouraged to apply. Familiarity with Latin or Greek is helpful but not required.

Required qualifications: Strong writing and research skills; attention to detail; intellectual curiosity about the history of education, of Brown University, and of classical studies. Coursework or experience in

Classics, History, or related humanities fields preferred. Applicants should be comfortable working with archival materials and taking careful notes. Please include a brief (1–2 page) writing sample that demonstrates analytical or research ability.

Preferred qualifications: Familiarity with Latin or Greek helpful but not required.

Modality: In person

Is this project for more than one student: No

Meredith Hastings
Department: Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)
Project Type: Research
Project Title: Breathe Providence: Interdisciplinary Studies of Air Pollution [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Breathe Providence is a new high-resolution air monitoring project based in Providence, RI. Our research team is currently operating 24 low-cost air monitors throughout the city that measure air quality and climate-related pollutants (CO2, CO, NOx, O3, and PM2.5). We aim to better understand pollution sources and patterns across the city at approximately a neighborhood scale. In particular, we're focusing on frontline communities and neighborhoods with high rates of respiratory disease that are not currently represented by state-run monitoring efforts. Throughout the site selection process, we've drawn on the Climate Justice Plan and guidance from community-based organizations. Ultimately, we hope to inform policies and community health initiatives that reduce emissions and exposure in overburdened areas. For summer 2026, we are interested in having several students working on different aspects of the overall project including (but not limited to): data analysis, interpretation and creating data visualizations for public consumption; developing and maintaining content for our website/newsletter/social media; outreach with organizations dedicated to youth empowerment and knowledge sharing/building; organizing outreach events with neighborhood associations or community-serving organizations (e.g., libraries, recreation centers, etc).

Required qualifications: Participation in this project necessarily requires a demonstration of strong written and oral communication skills, organizational skills, attention to detail, and motivation to work both independently and in a team environment. The position also requires a basic background in environmental studies or science (e.g., related coursework or work experience), as well as an appreciation for issues related to environmental justice. Additional required coursework or training will be based on the type of project the student is keen to pursue. For example, for data analysis and interpretation projects, some computer programming experience (e.g. R) and environmental or earth science background would be of interest.

Preferred qualifications: A preferred candidate will have completed coursework related to topics such as environmental science, chemistry, environmental justice, environmental engineering, and/or environmental policy and management. Engaged Scholar coursework and/or work experience engaging with public outreach/education is a plus. Spanish language skills would also be an asset.

Modality: In person

Is this project for more than one student: Yes

Timothy Herbert
Department: Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)
Project Type: Research
Project Title: The North Atlantic: engine of climate change

Project Description:
This project uses the record of North Atlantic deep-sea sediments that accumulated over millions of years to trace climate change in the region. Specifically, this project will look along the flow path of the North Atlantic Current, the ocean artery that brings heat up to Northern Europe and Scandinavia, and how that heat transport has changed along with global changes in earth's climate. We will do this through geochemical measurements of sediment materials that trace past ocean temperatures through time. The UTRA student will learn fundamentals of laboratory analysis, analyze new and existing data sets, and prepare a research poster to summarize their findings.

Required qualifications: Basic chemistry, comfort with Excel

Preferred qualifications: Coursework in earth history and/or oceanography, laboratory experience

Modality: In person

Is this project for more than one student: No

Leigh Hochberg, Carlos Vargas-Irwin, John Simeral
Department: Engineering, Carney Institute for Brain Science, VA Center for Neurorestoration and Neurotechnology, Neuroscience
Project Type: Research
Project Title: Decoding and signal analysis for intracortical BCIs

Project Description:
The overall aim of the research is to develop and implement novel methodologies for improving performance and accuracy of neural decoding for intracortical brain computer interface (iBCI) usage. iBCI technology has been successful in enabling control of a variety of external effectors in individuals with severe neuromuscular impairments. iBCIs record neural activity generated by attempted movements from electrodes placed in the cortical surface and decode that activity into control commands for computer cursors, keyboards, speech synthesizers and soft robotics. The research student will perform an independent study that supports one of our BrainGate scientific tracts (motor control, speech and personal computer use), aiming to answer open scientific questions that arise during ongoing research.

Projects may involve data analysis of intracortical neural activity, scientific experiment development in PyGame or Unity, validating experimental designs, or developing aspects of signal processing or decoder software. Our student researcher will work with human cortical neural signals under guidance of a BrainGate mentor and learn and apply a wide range of skills (e.g. neural signal processing, machine learning, real-time systems, scientific experiment development, hypothesis driven data analysis and/or programming in PyGame or Unity.). The UTRA project will directly contribute to ongoing scientific research and papers, and ultimately contribute to improving the iBCI technology that our study participants use.

Required qualifications: Proficient in Python, GitHub, Linux, strong affinity for coding and computing

Preferred qualifications: Experience with Unity, PyGame, Jupyter Notebook, digital signal processing, neuroscience / neural signals, machine learning. Demonstrable experience in neurotechnology projects

Modality: In person

Is this project for more than one student: Yes

Christopher Horvat
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Bespoke AI tools for extreme weather downscaling and forecasting

Project Description:
Anthropogenic climate change is a global public health emergency. Changes to tropical cyclones, and associated waves, winds, storm surge, and extreme rainfall have direct impacts on the health of individuals and the healthcare facilities that serve them. These risks are particularly relevant to geographically dispersed Pacific Island Countries and Territories (PICTs) - which bear an inequitable fraction of climate change impacts and whose healthcare infrastructure is expected to be under pressure in the coming decades. Policymakers must have interpretable, geographically specific, and statistically sound information about future climate-related risks, but face real challenges when accessing relevant data for making decisions.

In the EMPIRIC project, which you will join, we are attempting to address this need. Your role will be to work with us and our Pacific partners to develop an AI-driven tool for extreme event forecasting, by training and modifying bespoke machine learning methods for downscaling and prediction, and will culminate in a contribution to an online data portal hosted by the South Pacific Community (http://www.spc.int/). The project will primarily involve either development of a tropical cyclone statistical model (EMPIRIC_TC) or a downscaling method for resolving small island states typically missing from global climate models (EMPIRIC_DS)

Required qualifications: Ability to code in Python or related languages.

Preferred qualifications: Basic machine learning understanding. An interest in the Pacific or climate study.

Modality: In person

Is this project for more than one student: Yes

Christopher Horvat
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Quantifying Sea Ice Geometries from Space

Project Description:
The breakup of sea ice into smaller floes is a central process shaping the dynamics of the Arctic and Antarctic Marginal Ice Zones (MIZ). The distribution of floe sizes alters how sea ice interacts with waves, heat fluxes, and ocean mixing, playing a key role in both local and large-scale climate processes. Recent research shows that smaller floes accelerate lateral melting, increase ocean– atmosphere exchanges, and alter the mechanical strength of the ice pack. However, observational constraints on FSD remain sparse, particularly in summer when sea ice becomes highly fragmented.

This project focuses on advancing the detection and quantification of sea ice using Synthetic Aperture Radar (SAR) imagery. The proposed approach will help develop automated machine-learning techniques for ice and floe size distribution detection, using
machine learning techniques to extract floe boundaries from time series of SAR images and derive statistics on floe size, shape, and spatial organization. The UTRA scholar work with preprocessed image data to test classification and segmentation algorithms and evaluate their performance in capturing floe morphology under varying conditions, and design transfer learning approaches to apply information learned from the well-resolved Arctic to Antarctica.

Required qualifications: Python or similar skills in coding.

Preferred qualifications: An interest in the polar oceans.

Modality: In person

Is this project for more than one student: No

Evelyn Hu-DeHart
Department: American Studies, History
Project Type: Course Development
Project Title: Developing new modules for bilingual (Spanish-English)First-Year Seminar on the US-Mexico Border

Project Description:
This is a Course Development Project that also entails original research. Students will accomplish 3 goals and hone or learn 3 skills: 1) research a topic of their choice, 2) organize research findings into a Power Point module presentation, and 3) deliver a lecture to a class. I plan to update and revise my

First Year Seminar on the U.S.-Mexico Border that is offered through both American Studies and History. It is a bilingual seminar, with readings and class discussion conducted in Spanish and English, on topics ranging from history to music and literature; binational and transborder families and communities; migration to and from both countries across the border; surveillance, militarization and other forms of border control; indigenous peoples and immigrant communities on both sides; farm, field, factory and other forms of labor. I seek 4-5 students who have taken this seminar in their first year at Brown to develop new bilingual modules. In discussion with me, students will research and develop a module on a new topic of their interest, usually related to their concentration. In weekly group meetings and individual meetings with me every two weeks in person or over Zoom, students will report on their research findings, develop a module presentation with a Power Point, deliver drafts of the Power Point lecture to the group for comments, and revise the module which they will then deliver to the FY seminar when offered in the Fall semester after the summer.

Required qualifications: Students should have taken the FY Seminar one or two years before summer 2026 and be proficient in Spanish and English. They can come from any concentration, including STEM, Engineering, Public Health, in addition to Humanities and Social Sciences. Applicants should be rising seniors and juniors.

Preferred qualifications: Students who have taken my First Year Seminar on the US-Mexico border, and who are proficient in Spanish.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Yongsong Huang
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Novel molecular tools to quantify past sea ice changes in the Arctic ocean

Project Description:
Arctic sea ice has been declining in an unprecedented pace in the past several decades, resulting in major reduction in ocean albedo and rapid warming of the Arctic that is ~ 4 times faster than the global average. We urgently need to accurately project future Arctic sea ice trajectories in the coming decades. However, current climate models show major discrepancies in projected future sea ice changes in the Arctic, because of the relatively short satellite observational record of sea ice in the past 47 years. Quantitative reconstruction of past sea ice in the past hundreds, thousands of years and longer time scales is critical for improving the model parameterizations and increasing accuracy of future sea ice projections. This project will build on our recent discovery of a new type of molecular biomarkers that have been shown to quantitatively record sea ice concentrations from initial studies. Different types of haptophyte algae produce C37 to C39 long chain methyl and ethyl alkyl ketones (or alkenones) containing different numbers of trans-double bonds, with a recently phylogenetically classified 2i Isochrysidales thriving in sea ice infested regions and producing exceptional amounts of tetra-unsaturated alkenones. We have also developed new analytical method for these compounds that are hundreds of times more sensitive than traditional methods, allowing accurate measurements of alkenones in the Arctic ocean sites that cannot be detected using traditional methods based on gas chromatography. Surface

sediments and sediment core samples from the Arctic ocean will be measured to provide a comprehensive calibration between sea ice and alkenone distributions, and subsequently the calibrations will used to reconstruct sea ice changes in the central Arctic Ocean for the past 10 million years.

Required qualifications: Courses in organic chemistry, and/or environmental geochemistry. Strong interest in climate change research.

Preferred qualifications: Chemical Lab experiences

Modality: In person

Is this project for more than one student: Yes

Yongsong Huang
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Novel applications of UPLC-Orbitrap mass spectrometer (Exploris 240) in climate and biomedical research

Project Description:
A new, state-of-the-art ultra performance liquid chromatography - orbitrap mass spectrometer with 240,000 mass resolution (at m/z 200) has recently been funded by Major Research Instrumentation program of the National Science Foundation (Yongsong Huang is the lead PI of the grant proposal). The new instrument opens major new opportunities in several new fields including: 1) novel method to reconstruct past climate change by measuring oxygen isotope ratios of algal biomarker alkenones. Oxygen isotope ratios have long been successfully used to reconstruct global climate change for the past thousands, millions and hundred millions of years. But the measurements have been performed on calcium carbonate shells produced by marine zooplanktons. Unfortunately, these carbonate shells are not preserved in many parts of the global ocean. Measuring oxygen isotope ratios of the cosmopolitan algal biomarker alkenones using orbitrap MS can potentially fill the important gap. 2) Due to exceptionally high mass resolution, UPLC-Orbitrap MS provides an unprecedented opportunity to determine the molecular structures of biological compounds produced by microbes. Collaborative research projects are ongoing with Dr. Gerard Nau at Rhode Island Hospital to analyze bacterial volatile organic compounds (VOC) with potent anti-fungal properties. This research will establish sampling and sample introduction method of VOCs to UPLC-Orbitrap MS for qualitative and quantitative analyses.

Required qualifications: Organic Chemistry courses, Geochemistry courses, Strong interests in analytical method developments

Preferred qualifications: Lab experience

Modality: In person

Is this project for more than one student: Yes

Pauline Jacobson
Department: Linguistics, Philosophy
Project Type: Course Development
Project Title: Course Development for a new course: Language and the Law

Project Description:
There are many ways in which the tools of Linguistics play a role in legal decisions: just about every subfield within Linguistics is relevant to legal systems. An obvious example is voice recordings: knowledge of phonetics is used to help identify the speaker. Less obvious ones involve an understanding of Pragmatics, Semantics, Sociolinguistics and Syntax. Did a witness commit perjury or did they simply mislead? To answer that we need to tease apart literal meaning from conveyed meaning. Copyright and trademark infringement cases often depend on whether certain similarities in the linguistic framing can plausibly be accidental or not. Questions about the proper interpretation of legal documents - including the US Constitution - depend on attempts to disambiguate ambiguous language in order (in the case of the Constitution) to determine the intent of the framers. A famous example is: what is the intended meaning of 'nor cruel and unusual punishment inflicted'. Does this prohibit only punishment which meets both or does it prohibit both cruel punishment and unusual punishment. On the topic of pronoun use, recently the Linguistic Society of America filed an amicus brief 'demonstrating that pronouns are social, complex and dynamic' , arguing against Florida's ban on teachers stating their chosen pronouns in the classroom. Linguists have also analyzed trial transcripts revealing that biases against a certain minoritized dialects or failure to understand testimony in a 'nonstandard' dialect plays a role in jury decisions (see, e.g, Rickford and King, Language 2016). Analysis of the syntax of ransom notes has helped determine the author of such notes, as has analysis of the attempts to mimic certain accents in these written notes. The interaction of Language and the Law has spawned an entire field called Forensic Linguistics with a vast literature. I propose to develop a course exploring this field suitable to students at all levels who have no linguistics background. But the field is vast and while I have expertise in many of the relevant subdomains of Linguistics I do not at this point know what literature would be accessible to students and what would be of most relevance to the course goals. To that end I wish to hire a UTRA fellow over the summer to help with the course development.

Required qualifications: An Introductory Linguistics course (LING 0100 or its equivalent).

Preferred qualifications: Additional courses in linguistics, in particular at least one of phonetics, semantics, or pragmatics. The more background the better. Further, an interest in the law would make for an ideal candidate.

Modality: In person

Is this project for more than one student: No

Wilmot James
Department: Health Services, Policy & Practice, Pandemic Center
Project Type: Research
Project Title: Research on approaches countries can undertake to strengthen non-proliferation

measures, preparedness, early detection and warning biosurveillance and response to natural outbreaks, accidents, and deliberate biological events in rural and agricultural areas in Africa.

Project Description:
This project involves research on approaches countries can undertake to strengthen non-proliferation measures, preparedness, early detection and warning biosurveillance and response to natural outbreaks, accidents, and deliberate biological events in rural and agricultural areas in Africa. We are seeking actionable recommendations for integrating veterinary services into national interagency, regional and global biosecurity governance, covering interagency standard operating procedures (SOPs), chain-of-custody guidance, and measurable targets (detect-to-report, sentinel coverage, laboratory integration and cross border screening) that strengthen biosafety and biosecurity best practices in compliance with WHO Biorisk Management, Biological Weapons Convention and UNSCR 1540 norms and standards in rural and agricultural areas, national and cross border in Africa. The 7-1-7 framework and other measures - WHO JEE (Joint External Evaluation), Global Health Security Index and the developing Africa Health Security Index will be used to generate metrics, to measure progress in detection, reporting and response.

Required qualifications: Students should possess an interest in biosecurity, epidemiology and biosurveillance. Experience performing literature reviews is mandatory.

Preferred qualifications: Familiarity with frameworks and Indexes including the Global Health Security Index preferred. Experience using AI to perform literature reviews is also preferred.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Zhicheng Jiao
Department: Radiology
Project Type: Research
Project Title: NeuroRad Agent: An AI Assistant for Quantitative Neuro-Oncologic Imaging and Tumor Response Evaluation

Project Description:
This project will develop **NeuroRad Agent**, an agentic AI system that uses **high-precision tumor segmentation** to **quantify and track brain tumor changes over time** on MRI. Our core goal is to build an AI assistant that can automatically segment tumors, measure tumor size and volume at multiple time points, derive additional imaging biomarkers (e.g., edema extent, enhancement patterns), and summarize longitudinal changes to help clinicians assess treatment response in neuro-oncology.

Students will work with de-identified multi-timepoint brain MRI datasets (e.g., pre-treatment and follow-up scans) and state-of-the-art AI models. Depending on background and interest, tasks may include:

* Preparing and organizing longitudinal MRI data and corresponding annotations for AI model training and evaluation
* Running and benchmarking existing brain tumor segmentation models, and refining them for higher

accuracy and robustness
* Computing quantitative metrics across time (e.g., tumor volume change, percentage shrinkage/growth, new lesions, changes in T2/FLAIR signal) to characterize treatment response
* Designing basic agent workflows (e.g., “identify timepoints → segment tumor at each timepoint → compute change metrics → flag concerning cases”)
* Evaluating AI-derived measures against expert readings and helping define quality-control rules for reliable clinical use
* Creating visualizations or simple dashboards that display longitudinal curves and imaging snapshots in a way that is intuitive for clinicians

Students will gain hands-on experience with **AI for medical image segmentation, longitudinal analysis, and treatment response assessment**, along with practical skills in Python, ML evaluation, and scientific communication. This project is part of a broader lab effort to develop **clinically reliable imaging AI tools** for neuro-oncology. Interested students may be invited to attend lab meetings to see how NeuroRad Agent fits within our larger research program.

Required qualifications: Applicants should have strong programming skills in Python and prior experience with data analysis or image processing (e.g., using NumPy, pandas, scikit-learn, PyTorch, or similar libraries). Prior coursework or research experience in machine learning and/or computer vision is strongly preferred, especially if you have worked with image datasets, segmentation, or deep learning models. An interest in medical imaging, AI for healthcare, or biomedical applications is important, particularly for students who may want to pursue future research or graduate study in these areas. Students should be comfortable working in a Linux/Python environment, reading technical documentation, and debugging their own code. In your application, please briefly describe any relevant ML/CV projects, coursework, or research experience, and you are welcome to include a link to a GitHub repository, portfolio, or short code sample that demonstrates your skills.

Preferred qualifications: Applicants should have strong programming skills in Python and prior experience with data analysis or image processing (e.g., using NumPy, pandas, scikit-learn, PyTorch, or similar libraries). Prior coursework or research experience in machine learning and/or computer vision is strongly preferred, especially if you have worked with image datasets, segmentation, or deep learning models. An interest in medical imaging, AI for healthcare, or biomedical applications is important, particularly for students who may want to pursue future research or graduate study in these areas. Students should be comfortable working in a Linux/Python environment, reading technical documentation, and debugging their own code. In your application, please briefly describe any relevant ML/CV projects, coursework, or research experience, and you are welcome to include a link to a GitHub repository, portfolio, or short code sample that demonstrates your skills.

Modality: Remotely

Is this project for more than one student: Yes

Mark Johnson
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Gamete fusion and the block to polyspermy

Project Description:
Sexual reproduction occurs when two gamete plasma membranes fuse with each other, allowing two unique parental genomes to begin the life of a new individual. This process is fundamental, but we've only recently discovered a protein that seems to be responsible for merging the gamete membranes. Now, we can ask interesting questions about how this process is regulated to ensure that gametes fuse in pairs. We have a collaborative team that is taking a combination of genetic (CRISPR-cas mutagenesis, transgenesis), and imaging (confocal microscopy of ion and protein dynamics, electron microscopy) approaches to test the hypothesis that gamete plasma membrane fusion is negatively regulated by depolarization of the female gamete membrane upon fertilization. Further, we propose that the sperm-expressed fusion protein (HAP2/GCS1) is disabled by membrane depolarization. Thus, only one sperm can fuse with an egg.

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/intermediate coursework in Biology and/or Chemistry.

Preferred qualifications: Experience working with genetic model organisms in a research setting, microscopy/imaging/image analysis, making chemical solutions, basic molecular biology (PCR, gel electrophoresis). Some of the following courses would be helpful: Biol 0470, Chem 330, Biol 0500, Biol 0280, Biology of Reproduction, other advanced biology courses

Modality: In person

Is this project for more than one student: No

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

Modality: In person

Is this project for more than one student: No

Tyler Jost
Department: International and Public Affairs, Political Science
Project Type: Research
Project Title: Origins of Major Power Cooperation

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 project 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.

Modality: Remotely

Is this project for more than one student: Yes

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 instead convey important social meanings within a given context. Korean, known for its rich honorific system, reflects addressee honorifics in verbal endings, providing speakers with multiple options when creating an utterance toward addressee. The Korean language offers six different speech styles that speakers may choose from depending on their relationship with the 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.

This study examines speech style shifts that occurred during cooking club activities among both non-native and native speakers of Korean. Spoken data were collected from participants in a cooking club I led as part of the co-curricular activities offered during a Korean language summer immersion program. The club met weekly for two hours over seven weeks, generating approximately 14 hours of recordings per year. With two consecutive years of data collection, the total amounted to 28 hours of recorded interaction.

The study investigates three key questions related to speech style shifts in these interactions. First, it aims to identify the situations that prompt participants to shift their speech styles. Second, it examines the role of prosody in these speech style shifts, particularly in relation to ethnicity, gender, and language proficiency. Finally, it explores whether participation frames differ between native and non-native speakers, focusing on possible distinctions in their level of engagement within the cooking club setting.

The student working on this project will transcribe the recordings, translate selected portions of interactions into English, and code the speech styles for analysis. Under faculty guidance, the student will gain experience analyzing spoken data from an indexical perspective and will learn to use tools such as CLAN (Computerized Language ANalysis), Praat, and Daglo.

Required qualifications: Advanced Korean language proficiency, especially near-native listening skills; proficiency in computer software (i.e., MS Office); strong communication and organization skills; and a good work ethic.

Preferred qualifications: N/A

Modality: Remotely

Is this project for more than one student: No

Tyler Kartzinel
Department: Ecology, Evolution & Organismal Biology, Institute at Brown for Environment and Society (IBES)
Project Type: Research
Project Title: Wildlife ecology in Yellowstone National Park [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Yellowstone National Park is a biodiversity and cultural hotspot. Large mammals including bison, elk, deer, pronghorn antelope, and bighorn sheep engage in epic annual migrations across the ecosystem and have critical roles in its food web. Yet despite the significance of these animals and their migrations, we understand relatively little about their foraging ecology and behavior. This project addresses the question: what food plants provide the fuel that these animals need to complete their great migrations? Project participants will conduct fieldwork in collaboration with a team of researchers from Brown University and the National Park Service. Skills and knowledge that will be gained include basic experimental ecology and research methods such as plant identification and monitoring, tracking and observing animals, conducting experiments to characterize plant-herbivore interactions, running genetic analyses, and working with large electronic datasets. Part of the program will take place at our field sites in Yellowstone and the remainder may continue on campus. Housing will be provided for the research team in Gardiner, Montana. If fieldwork proves logistically infeasible due to remote travel concerns or government shutdowns, there will be additional opportunities to collaborate in our molecular ecology lab at Brown or to reorient the project around a remote/hybrid collaboration involving project data. For more information about the lab and our project, please visit: https://www.kartzinellab.com/

Required qualifications: Coursework in plant biology, ecology, biostatistics or experimental design. Ability to work under rugged outdoor conditions in remote wilderness areas.

Preferred qualifications: Ability to work with large data sets in Excel. Stamina for fieldwork as evidenced by outdoor experience or sports, coursework or other experience involving genetics or molecular techniques.

Modality: In person

Is this project for more than one student: No

Rebecca Kartzinel
Department: Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Tracking Rhode Island's Rare Plants [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Informed conservation and ecosystem management decisions rely on up-to-date biodiversity data, especially information on the distribution and occurrence of rare and endangered species. In Rhode Island, these biodiversity data are stewarded by the Rhode Island Natural History Survey (RINHS), which provides information on the viability of plant and animal populations in the state to all for planning, research, conservation, and regulatory activities. Data on the occurrences of rare species are, ideally, updated with regular field visits and surveys by staff and volunteers at RINHS. However, every year there is a significant shortfall between rare plant sites needing re-visits and the number of qualified people available to make them, meaning our information on these populations grow increasingly outdated.

This project is a collaboration between the Brown University Herbarium and RINHS, with a goal of surveying natural areas within Rhode Island to monitor and collect data on rare plants. Using a list of

target species provided by RINHS, students will plan and carry out site visits to natural areas around the state for monitoring. Tasks will include: Preparing for field work, which includes reviewing the target species' seasonality and habitat requirements, compiling information from prior field observations, and securing landowner permission; carrying out field monitoring, which includes navigating to field sites (often off-trail) to search for target species, completing observation data forms, taking photos and possibly voucher samples; and relevant office tasks such as data entry, photo labeling, and herbarium specimen preparation. Students will become familiar with field techniques for plant identification and monitoring; habitat and plant species diversity in Rhode Island; biodiversity database management; and herbarium specimen preparation. We anticipate that students will spend 2-3 days per week in the field and the remainder of the time completing office and/or herbarium tasks. Students will work in the field alongside Prof. Kartzinel and/or staff or volunteers from RINHS.

Required qualifications: Coursework in plant biology, ecology, and/or conservation. Candidates should be willing and able to participate in day-long field excursions in hot, buggy and/or rainy weather and carry equipment when needed. Our field work often involves hiking off-trail in brushy, muddy, and/or swampy areas, and maintaining a positive attitude in these conditions is essential.

Preferred qualifications: Ability to work with large data sets in Excel; experience with GIS; experience in plant identification, especially using dichotomous keys.

Modality: In person

Is this project for more than one student: Yes

Megan Kizer
Department: Chemistry, Engineering, Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Generation of Diverse Glycan Binding Protein Libraries and their Directed Evolution

Project Description:
Complex carbohydrates (glycans) are biomolecules implicated in human health and disease, and are particularly relevant biomarkers across cancers due to their aberrant expression. Glycans and glycoconjugates are critical players in tumorigenesis, however our ability to directly interrogate such glycan aberrations in a cancer context are severely limited. In this project, we aim to develop Glycan Binding Proteins (GBPs) for detection of glycan-related biomarkers in cancer. Our long-term goal is to leverage the resulting GBPs in a point-of-care diagnostic device that detects various glycan epitopes as indicators of disease.

This project builds off of a yeast surface-display (YSD) directed evolution platform which generated the first GBP of its class – targeting a pan-carcinoma antigen termed the Thomsen-Friedenreich (TF) antigen. Recently, we have gained molecular insights of this GBP-glycan interaction and aim to incorporate these insights into further rounds of and expanded targets scope for this class of GBPs.

Students working on this project will leverage molecular biology techniques to generate diverse libraries of GBPs in a YSD context. They will then induce protein expression on the cell surface and employ the libraries in a directed evolution pipeline. Depending on student interests and background, they can also

be involved in the bioconjugation necessary to generate multivalent antigen presentations for the directed evolution pipeline. Students will learn how to run a flow cytometer with the assistance of a grad student mentor, and will be able to critically work up and analyze resulting flow data. Students are encouraged to review the group webpage (sites.brown.edu/glycotech) and reach out to the PI for more project information.

Required qualifications: Students must be willing to do lab-based experimental research, work well in a team environment, and have taken introductory biology and/or chemistry courses. Students should have at least progressed through the core organic and biochem lab-related courses, CHEM 0350/0360 and BIOL 0285. In lieu of not having taken the entirety of the more advanced orgo/biochem courses, students with prior research experiences may be considered.

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: Yes

Megan Kizer
Department: Chemistry, Engineering
Project Type: Research
Project Title: Bioconjugation of Tumor-Targeting Glycan Binding Proteins for Improved Cancer Therapeutics

Project Description:
Complex carbohydrates (glycans) are biomolecules implicated in human health and disease. Glycans and glycoconjugates are critical players in cell development, tumorigenesis, infection and beyond. Driven by the low efficacy and large side effects of many cancer therapeutics, this project aims to develop novel targeted therapeutics for improved cancer treatment. We leverage glycan binding protein (GBPs) as our targeting ligand, which interacts with a mucin-associated disaccharide (the TF antigen) overexpressed in over 80% of tumors. Applications of these GBP-targeted therapeutics in vitro and in vivo will demonstrate tissue selectivity and therapeutic efficacy of these new biomaterials, ultimately guiding rational design of novel glycan therapeutics for cancer.

This project expands upon previous work in the group, towards generating improved cancer therapeutics through targeting aberrant glycan epitopes upregulated on the surface of tumors. Specifically, we are now focusing on the bioconjugation of our TF-targeting GBP to drug-loaded lipid nanoparticles and theranostic inorganic (Fe-Au) nanoparticles. The student working on this project will optimize bioconjugation procedures and test different GBP densities on the cell surface to determine optimal targeting ligand density for cell uptake. The targeted therapeutics will be characterized using electrophoretic mobility shift assay (EMSA), dynamic light scattering (DLS), and scanning electron microscopy (SEM). Should time permit, students will be able to apply the synthesized therapeutic materials to in vitro cell culture models to determine nanoparticle uptake. Students working on this project will obtain exposure to a broad skillset including, bioconjugation, protein purification, nanoparticle analysis, and appropriate analytical and characterization techniques as needed. Overall, students will gain interdisciplinary experience across molecular biology, biochemistry, and chemistry. Students are encouraged to look at the group webpage

(sites.brown.edu/glycotech) and contact the PI for more project information.

Required qualifications: Students must be willing to do lab-based experimental research, work well in a team environment, and have taken introductory biology and/or chemistry courses. Students should have at least progressed through the core organic and biochem lab-related courses, CHEM 0350/0360 and BIOL 0285. In lieu of not having taken the entirety of the more advanced orgo/biochem courses, students with prior research experiences may be considered.

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: No

Sheryl Kopel
Department: Pediatrics, Behavioral and Social Sciences, Psychiatry and Human Behavior
Project Type: Research
Project Title: Pediatric Behavioral Health Research: sleep, diet, asthma, and immune function

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.).

This opportunity will provide excellent research training and public health experience 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: 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, ASANA, Canva). Experience working with ethnically, culturally, and racially diverse communities.

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

Modality: In person

Is this project for more than one student: Yes

Gideon Koren
Department: Medicine
Project Type: Research
Project Title: Cardiac-Specific AAV9 Gene Therapy Engineering for Long QT Syndrome Type 2

Project Description:
This project focuses on developing and testing a next-generation, cardiomyocyte-specific gene therapy for Long QT Syndrome Type 2 (LQT2) using AAV9 vectors driven by a cardiac troponin T (cTnT) promoter. Previous AAV constructs that relied on ubiquitous promoters produced strong gene expression but frequently caused off-target skeletal muscle expression, contributing to adverse phenotypes such as splay-leg in rabbit models. To address these limitations, the current project aims to refine promoter and shRNA design to achieve precise cardiac targeting, optimized expression of wild-type hERG, and effective knockdown of mutant hERG transcripts. If the optimized LQT gene therapy vector demonstrates efficacy in vitro, it will next be evaluated in transgenic LQT2 rabbits, with the long-term goal of advancing a viable gene therapy approach for LQT2 patients.

Students will contribute to multiple phases of vector development and characterization. Laboratory tasks may include molecular cloning (restriction digestion, PCR, plasmid construction), viral vector preparation (AAV6/AAV9 packaging), and in vitro testing using HEK cells, H9c2 myocytes, HL-1 cardiomyocytes, and primary rabbit cardiomyocytes. Experimental readouts will quantify transgene expression, shRNA function, and promoter specificity. These data will support the broader goal of evaluating whether cTnT-driven AAV9 constructs provide safer and more effective cardiac gene therapy compared to conventional CMV-based systems.

Through weekly meetings, students will develop proficiency in experimental design, data interpretation, and collaborative research communication. By the end of the experience, students will gain hands-on training in molecular biology, viral vector engineering, and translational gene therapy research, contributing meaningful data to an emerging therapeutic strategy for inherited cardiac arrhythmias.

Required qualifications: Completion of at least one introductory biology or chemistry course (e.g., BIOL 0200, CHEM 0330, or equivalent).

Strong interest in molecular biology or gene therapy.

Ability to follow detailed lab protocols and keep organized notes.

Basic lab skills (pipetting, preparing solutions); willingness to learn new techniques.

Reliability, attention to detail, and consistent communication with the research team.

Availability for 8-10 full-time weeks in Summer 2026.

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: No

Laura Korthauer
Department: Psychiatry and Human Behavior, Cognitive and Psychological Sciences
Project Type: Research
Project Title: Remote digital cognitive assessment in rural older adults [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Rural older adults face higher risk of dementia and delayed diagnosis. Lack of availability of specialty providers in rural areas compounds these health disparities and limits access to disease-modifying therapies. The goal of this project is to examine the feasibility of remote digital cognitive assessment to detect cognitive impairment in rural-dwelling elders. Through a partnership between Brown Health researchers and researchers at the University of Arkansas for Medical Sciences, we will deliver remote digital assessment to rural older adults. This will be compared to reference standard neuropsychological tests to determine the acceptability and efficacy of digital screening. There will also be opportunities to assist with qualitative interviewing with stakeholders (e.g., rural healthcare providers, older adults) and qualitative analysis. Students will gain exposure to quantitative and qualitative research methods. They will assist with data collection and statistical analysis.

Required qualifications: Strong organization and communication skills

Preferred qualifications: Prior human subjects research experience, coursework related to cognitive assessment and/or neurodegenerative conditions

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Michael Koster
Department: Pediatrics
Project Type: Research
Project Title: Vaccine Demand [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
The goal of this project is to develop novel and effective channels of communication about science. Specifically, in this case effective scientific communication regarding vaccines. The project will center on

partnerships between the Department of Health, SoPH Information Futures Lab, Alpert Medical School, and the Rhode Island American Academy of Pediatrics. Focus groups with non-English speaking key informants on how science information is received and socialized in communities of Rhode Island along with geo mapping of vaccine cold spots will be first steps in understanding the current landscape. The DOH has geomapped "cold spots" of vaccine uptake, and we will be using federally qualified health centers as additional stakeholders to help inform possible novel communication strategies. We are seeking Spanish-speaking students with strong ties to communities in Rhode Island, experience working with community leaders across sectors including health, faith, and vocational groups to establish best partnerships.

Required qualifications: Spanish fluency, Strong community engagement, passion for vaccines
Sophomore or rising junior.

Preferred qualifications: Any medical experience, such as MA, LPN, EMT, or experience supporting health initiatives

Modality: In person

Is this project for more than one student: No

Matthew Kraft
Department: Education, Economics
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 UTRA will focus on developing new lines of research at the nexus of education systems and climate change. We will explore questions such as 1) how do extreme weather events affect student attendance and achievement?, 2) what is the effect on students when schools are located in close proximity to a pollution sites such as a Brownfields or Superfund site, and 3) how do science standards impact what students know about climate change and the careers they choose?

Required qualifications: No required qualifications.

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

Modality: Remotely

Is this project for more than one student: Yes

Matthew Kraft
Department: Education, Economics
Project Type: Research
Project Title: What are the effects of paying K-12 teachers more money?

Project Description:
We currently have a limited understanding about how the labor market responds to changes in teacher wages and how these investments affect student outcomes. I propose to build on analyses I began at the Council of Economics Advisers to examine how changes in teachers' relative wages across states over time affect new teacher supply and student achievement using a difference-in-differences/event study design. I will calculate teacher relative wages using the CPS and build a state-by-year panel dataset from 2000 to 2025 linked with annual measures of newly licensed teachers collected by the Federal Office of Title II as well as student achievement data captured by the National Assessment of Educational Progress (NAEP) and state assessments harmonized by the Stanford Education Data Archive. I will complement this national analysis with state-specific studies of more recent efforts to raise minimum starting salaries and/or increase wages. Wage reforms in several states (e.g., AR, IA, MD, MO) present opportunities to identify the effect of statewide salary minimums with the natural experiment created by variability in pre-reform wages across districts.

Required qualifications: Basic experience working with statistical software program STATA

Preferred qualifications: Ability to find public datasets online, code and clean data, and conduct literature reviews.

Modality: Remotely

Is this project for more than one student: Yes

Shriram Krishnamurthi, Tim Nelson
Department: Computer Science
Project Type: Research
Project Title: New Solvers for Forge

Project Description:
This project will extend Forge, the solver tool used in CSCI 1710 (Logic for Systems), with a new solver engine based on Binary Decision Diagrams (BDDs). BDDs have long been used for software and hardware verification, and have seen recent use for, e.g., verifying network configurations. This new engine will give students in the course a broader perspective, strengthen their industrial skills, and highlight new advances in the field.

Required qualifications: Applicants must have one of the following: (1) a strong grade in 1710; or (2) plans to take 1710 in Spring 2026 and strong performance in either one of the preferred courses or a programming-intensive upper-level course; or (3) exceptional performance in CSCI 0190.

Applicants must be comfortable with mathematical concepts like logic and with implementing algorithms and data structures.

Applicants must also provide an Internal Academic Record (IAR) for faculty-sponsor review.

Preferred qualifications: CSCI 1260 (Compilers), CSCI 1715 (Formal Proof and Verification), CSCI 1730 (Programming Languages), and/or CSCI 2951O (Foundations of Prescriptive Analytics).

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Matthias Kuehne
Department: Physics
Project Type: Research
Project Title: Intercalation of 2D materials heterostructures

Project Description:
The project aims to study the electrical and optical properties of few-layer Graphene and transition metal dichalcogenide heterostructures. The main goal is to introduce ions (like lithium) through intercalation to induce and observe quantum phase transitions, exciton transfer, and Moiré reconstruction at the interface of these 2D devices.

Required qualifications: Strong enthusiasm for physics and a good understanding of solid-state physics are essential. The applicant must be diligent and show high potential.

Preferred qualifications: Knowledge of quantum mechanics or prior experience with programming/data analysis is preferred.

Modality: In person

Is this project for more than one student: No

Matthias Kuehne
Department: Physics
Project Type: Research
Project Title: Electrothermal investigations of nano-confined water

Project Description:

Carbon nanotube provides an excellent platform for studying dynamics of nanoscale confinement. Their range of diameters falls within the “single-digit nanopore” regime, referring to pores with diameters smaller than 10 nm. We are particularly interested in understanding the thermal properties of water under such extreme confinement. To investigate this, we use the “3ω” method to measure the heat capacity and thermal conductivity of the water-nanotube system.
This project involves several components, including nano-fabrication of the device, electrical transport measurements, molecular dynamics (MD) simulations of confined water, and numerical modeling for the overall system. In participating in the project, the student will be able to develop their skills in MD simulation, numerical calculation, and learn basic principles of electrical transport measurement. This experience will give the student exposure to both experimental and computational techniques in condensed matter and material science.

Required qualifications:
- The student is expected to be interested in physics, engineering, or related fields.
- Ability to work collaboratively and communicate clearly.
- Basic familiarity with algebra, introductory physics, solid state physics.
- Basic familiarity with programming (e.g., Python, MATLAB or Mathematica).

Preferred qualifications:
- Familiarity with laboratory environments or hands-on projects
- Curiosity about experimental science and problem-solving

Modality: In person

Is this project for more than one student: No

Greg Landsberg
Department: Physics
Project Type: Research
Project Title: Unsupervised anomaly detection in jets at the Large Hadron Collider

Project Description:
Large Hadron Collider (LHC) at CERN (near Geneva, Switzerland) is a cutting-edge energy frontier facility with the major goal of finding physics beyond the established description of our Universe, known as the Standard Model. While many dedicated searches for new physics have come empty-handed so far, there are strong theoretical reasons to believe that the Standard Model is incomplete, despite its enormous success. At the same time, signatures for new physics may be different from the proposed theoretical paradigms and appear just as subtle modifications of the properties of various objects in proton-proton collision events. In particular, jets--- the product of fragmentation of quarks and gluons, particles most copiously produced at the LHC--- may carry these subtle signatures of new physics in their internal structure. Given the lack of precise knowledge of how these modifications may look, a search for such anomalous signatures is a perfect problem for the rather novel concept in artificial intelligence: unsupervised machine learning. In this approach, the discriminator based on deep neural networks and autoencoders, is trained on a large sample of ordinary jets expected from the Standard Model processes, either using Monte Carlo simulation or control samples in data that are not expected to have significant contamination from new physics. At the next step, jets from classes of events likely to contain subtle

anomalies are subjected to this classifier, and their degree of difference from the training sample is quantified as an anomalous score. We can check the validity of this approach utilizing "known anomalies", e.g., jets that are the product of two or more merged jets due to highly Lorentz-boosted signatures, or jets coming from the long-lived particles, such as bottom or charm quarks. The ultimate goal is to add all the known anomalies to the training sample, with the goal of searching for the "unknown anomalies", which may be either detector malfunctions or signatures of new physics. The project could support up to four UTRA students, given its modular structure and the possibility of exploring different classifier architectures (e.g., transformers and graph neural networks with regular vs. variational autoencoders) in parallel.

Required qualifications: Operational knowledge of python, basic knowledge of quantum mechanics and/or particle physics

Preferred qualifications: Experience with machine-learning frameworks (e.g., KERAS, Pytorch), basic knowledge of particle physics.

Modality: In person

Is this project for more than one student: Yes

Greg Landsberg
Department: Physics
Project Type: Research
Project Title: Je charge tagging at the Large Hadron Collider

Project Description:
Large Hadron Collider (LHC) at CERN (near Geneva, Switzerland) is a cutting-edge energy frontier facility with the major goal of finding physics beyond the established description of our Universe, known as the Standard Model. While many dedicated searches for new physics have come empty-handed so far, there are strong theoretical reasons to believe that the Standard Model is incomplete, despite its enormous success. Searches for physics beyond the Standard Model are one of the most important avenues pursued at the LHC. These signals are typically buried under enormous backgrounds from Standard Model processes, so advanced machine-learning techniques are often used to uncover elusive signals. Among new tools being developed with the CMS experiment at the LHC are the jet charge taggers that could identify the charge of a heavy-flavor jet (i.e., whether it originates from b quark, c quark, or their antiquarks) by using graph neural networks and/or transformer architectures. The project will target the improvement for the existing algorithm by incorporating additional information about the displaced vertices within jets, as well as flavor taggers typically used for B physics analyses, which can help distinguish jets originating from different types of quarks.

Required qualifications: Operational knowledge of python, basic knowledge of quantum mechanics and/or particle physics.

Preferred qualifications: Experience with machine-learning frameworks (e.g., KERAS, Pytorch), basic knowledge of particle physics.

Modality: In person

Is this project for more than one student: Yes

Tomo Lazovich
Department: Data Science Institute
Project Type: Research
Project Title: Mapping AI use and impacts in public benefits programs

Project Description:
Low income workers and families are constantly subjected to decisions made by algorithmic systems, particularly in the area of public benefits. Programs like SNAP, Medicaid, and unemployment benefits are crucial, yet applicants can often be erroneously denied these resources due to algorithmic bias. The goal of this project is to, in some sense, use AI to demystify the role of AI in distributing these critical benefits. We will use large language models to help launch a massive nationwide public records campaign, assembling the first comprehensive dataset documenting the uses of AI in public benefits programs. LLMs will be used to both draft requests and process incoming data from responses. The ultimate goal is for this dataset to power products and programs that help low-income individuals navigate the complex benefits system, empowering them with more information to build better applications and challenge denials when they happen.

Required qualifications: An interest in the societal impacts of algorithmic systems

Preferred qualifications: Any of the following: experience with natural language processing in Python, experience in legal research, knowledge or interest in concepts of algorithmic fairness, data science skills, writing skills. (Bonus if you have taken CSCI 1491 - Fairness in Automated Decision Systems)

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Matt LeBlanc
Department: Physics
Project Type: Research
Project Title: Understanding jets at the future Muon Collider

Project Description:
One proposed future collider that combines the precision of lepton collisions and increases collision energy beyond that of the Large Hadron Collider is a muon collider, which could potentially be sited within the US on the Fermilab campus. Muons are unstable, which creates significant experimental challenges in the form of a “beam-induced background” (BIB): large numbers of photons and neutrons that pass through the detector from upstream decays. This background particularly complicates the reconstruction of particle jets, which are composite objects with a significant area in the detector.

The goal of this project is to study aspects of jet reconstruction in the context of the muon collider BIB. All aspects of jet physics may be considered, depending on the interests of the student: possible avenues of study include comparing jet clustering algorithms, noise-suppression techniques, calibration methods and the study of calorimeter cluster reconstruction and/or particle flow algorithms.

This project offers an opportunity to gain valuable experience in simulation and software development within the domain of particle physics, and to make valuable contributions to a quickly growing collaboration. It 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 and around the world.

Required qualifications: N/A

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: No

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: Some software development experience

Preferred qualifications: N/A

Modality: In person

Is this project for more than one student: No

Maayan Leroy-Melamed
Department: Pediatrics
Project Type: Research
Project Title: Sexual and Reproductive Health in Adolescents and Young Adults with Sickle Cell Disease [This project is cross-listed with the Brown Laidlaw Scholars Program.]

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 have begun interviewing and transcribing recordings of the interviews and will continue through the spring and maybe summer.
We also have related studies related to sexual and reproductive health in adolescents and young adults with sickle cell disease, specifics will depend on ongoing studies and grant funding. This project seeks to engage the sickle cell patient advisory council in any and all elements of research.

Required qualifications: Non-judgmental approach to reproductive health, interest in social and reproductive justice.

Preferred qualifications: Any experience with research studies, completion of CITI training.

Modality: Hybrid (remote and in-person)

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 increasingly takes place online, both to reach more people and to reflect the online nature of much of daily life and work. Doing this sort of research requires cutting-edge web-based tools to study human behavior and cognition. For our work on understanding how people collaborate with human and AI partners and learn how to play games and do critical tasks in daily life and work, we could

use a student with experience in web-design (user-facing) to help create online and offline games that can be used in human psychology experiments. This might include recreating existing games (Boggle, Tetris, Chees, Farming/Mining simulators, or others), or creating entirely new games 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, primarily on campus. 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, Unity, etc. If you have some programming experience and are eager to learn the skills above that you don't already know, or have game design experience but less knowledge of web deployment, that is ok as well, this would be a great opportunity to learn.

Preferred qualifications: Experience with project management, hosting, and data management via things like Git, AWS, mySQL nice, but definitely not required.

Modality: In person

Is this project for more than one student: No

David Levari
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: The Psychology of Social Judgment, Performance Evaluation, and Error Detection with Human and AI Partners

Project Description:
Humans often judge others to decide how well they are doing at a task, and whether they need help. A parent gets frustrated as their child struggles to tie their shoes; a manager sighs as their employee misses a deadline; a basketball coach watches a player miss an easy layup. Today, we even evaluate generative AI models such as ChatGPT when we assign them important tasks ("does this AI-generated Javascript function really work as promised?"). How does the mind monitor the performance of other human and machine agents? How do low-level processes such as perceptual adaptation and predictive coding influence how well we detect the errors agents make, and how accurately we integrate those errors into more global evaluations of overall performance, competence, and effort? How does this process of performance evaluation influence downstream behaviors such as advice giving, hiring decisions, and childcare? When performance evaluations go wrong or are overly negative, how might it contribute to undesirable outcomes such as toxic workplace supervision, antisocial behavior, and even child abuse? 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, cognitive science, economics, computer science, political science, marketing, organizational behavior, or related disciplines. For more information:

https://davidlevari.com/

Required qualifications: No experience required. Anyone eager to learn new scientific methods, theories, and ideas would be a great fit.

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.

Modality: In person

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 [This project is cross-listed with the Brown Laidlaw Scholars Program.]

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 student will build on the work already carried out by students over the Summer, and Fall (2025) and the Spring (2026). This includes documenting, analyzing, and presenting data on racial and socioeconomic inequities in Rhode Island, and communities' responses, in an accessible and engaging format for a public audience. The students may also interview community leaders as we seek to better understand the effects of these actions across a range of issues, including immigration, health, education and social security.
The student will be supervised by Patsy Lewis, Research Professor, Department of Africana Studies and Dr. 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

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Patsy Lewis
Department: Africana Studies
Project Type: Course Development

Project Title: **In the Wake of George Floyd: Engaged Scholarship course**

Project Description:
The engaged scholarship course focuses on the relationship between marginalized communities and the police and their experiences with other structured forms of discrimination, including racism. The course builds on the digital humanities project 'In TheWake of George Floyd: Mapping Social Movements (https://mappingsocialmovementsri.digitalscholarship.brown.edu). The student will continue the work begun by the Spring UTRA, which involves identifying literatures on social movement, the Black Lives Matter movement, community engaged research, the role of digital humanities, historical documentation on RI that better help us to understand the evolution of the relationship of these communities with the state, as well as relevant documents and studies and key organizations supporting these communities. The student will also help with the basic outlines of the course syllabus.

Required qualifications: Some experience with community engaged courses is desirable but not necessary.

Preferred qualifications: N/A

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Monica Linden
Department: Neuroscience
Project Type: Course Development
Project Title: **Updating Neural Systems Workbook**

Project Description:
NEUR1030 - Neural Systems makes extensive use of a workbook both for in-class group problem solving and as practice questions for assessments. The NEUR1030 workbook was developed in 2020 and 2021. It is essentially a collection of old assessment questions organized by topic. I would like to revise the workbook to include assessments from 2021 - 2025 and to tag questions with their learning objectives. Both of these changes will facilitate student learning. Additionally, I would like to discuss the possibility of adding multimedia components to the workbook. I would also like the UTRA student to design a way for us to collect feedback about the workbook.

Required qualifications: Student must have completed NEUR1030. Strong organizational skills are also required.

Preferred qualifications: Experience with multimedia texts.

Modality: Hybrid (remote and in-person)

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.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Ying Ma
Department: Biostatistics, Center for Computational Molecular Biology
Project Type: Research
Project Title: Integrated Spatial Multi-Omics and Multi-Slice Analysis for Reconstructing Tissue Architecture

Project Description:
Recent advances in spatial transcriptomics (ST) and spatial multi-omics have transformed our ability to study cells within their native tissue environments. These technologies measure gene expression, chromatin accessibility, protein abundance, and histology directly in intact tissue sections, offering new opportunities to understand cell–cell communication, regulatory programs, and disease-related microenvironments. However, making full use of these data requires new computational and statistical methods that can integrate multiple molecular modalities and multiple adjacent tissue slices. This project focuses on developing and applying novel machine learning and statistical frameworks to integrate spatial multi-omics data and align multiple tissue slices. A central component of the project builds on our recent method in NeurIPS 2025, JADE (Joint Alignment and Deep Embedding), which simultaneously learns low-dimensional molecular embeddings and spatial correspondence across slices. We aim to extend this

idea to incorporate multiple omics modalities—such as gene expression, chromatin accessibility, and morphological features—to create unified representations that capture tissue structure more accurately than single-modality analysis.

Students participating in this project will gain experience in spatial transcriptomics, multimodal data integration, deep learning, and statistical modeling. Opportunities include developing algorithms, analyzing real spatial datasets from human and animal tissues, visualizing spatial patterns, and contributing to open-source software. Prior experience with R or Python is helpful but not required; curiosity, attention to detail, and willingness to learn are most important. Students are also welcome to join a lab meeting to learn more about ongoing projects and meet the research team.

More information about our lab's research can be found here:
https://yma-lab.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] Yuanchuan Guo, Jun S Liu, Huimin Cheng, and Ying Ma, JADE: Joint Alignment and Deep Embedding for Multi-Slice Spatial Transcriptomics

Required qualifications: We welcome undergraduate students from diverse academic backgrounds who are enthusiastic about computational biology. The following skills or experiences are recommended or will be helpful for success in this project: (1) Programming experience in Python. (2) Have prior experience working on machine learning or deep learning models (e.g., through coursework like Introduction to Machine Learning, Artificial Intelligence, or relevant online modules). (3) Interest in biological data analysis or genomics. No prior knowledge of spatial transcriptomics is necessary—background materials will be provided. (4) Comfort with data analysis and visualization tools such as NumPy, Pandas, or Matplotlib is a plus. (4) Strong communication skills and willingness to participate in weekly research meetings and team discussions. Students will receive mentorship and technical guidance throughout the project, and we encourage applications from students who are excited about learning deep learning methods and applying them to cutting-edge biological problems.

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, deep learning in genomics, Linear algebra, Statistics

Preferred qualifications: Experience using PyTorch or TensorFlow for deep learning model development
Strong interest in Computational Biology
Experience with data visualization (e.g., Matplotlib, Seaborn, ggplot2)
Strong written and verbal communication skills for presenting and discussing scientific results

Modality: In person

Is this project for more than one student: Yes

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 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. In addition to receiving mentorship from Dr. Marshall, her research staff, and her graduate students, 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 12-1:30 PM), conducting 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. Regular weekend and evening 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/. Prior to submitting the UTRA application, all prospective UTRA applicants are encouraged to arrange a meeting with the lab managers to discuss the M&M lab's research program. To arrange such a meeting, 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 or summer for which they are applying to work in the lab. Summer RAs must be available on Tuesdays from 12-1:30 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: Experience working with children ages 5-12. Experience talking to strangers (i.e. cold calling, customer service).

Modality: In person

Is this project for more than one student: Yes

Sonia Mayoral
Department: Neuroscience, Carney Institute for Brain Science
Project Type: Research
Project Title: Investigating the Impacts of Myelin on Axonal Mitochondria

Project Description:
The Mayoral lab in the Department of Neuroscience is seeking an undergraduate researcher to help investigate the impacts of myelination on neuronal axons in the CNS. Using a novel mouse model of partial optic nerve myelination, our lab has shown that myelination locally slows axonal degeneration following a transection injury by suppressing the activation of a key, pro-degenerative enzyme, known as Sarm1. Sarm1 is an NADase known to be localized to mitochondria. To begin to understand how myelination may suppress Sarm1 activation, the UTRA student will investigate mitochondrial abundance and morphology within axons of myelinated and unmyelinated optic nerve regions. These investigations will involve 1) analysis of ultrastructural transmission electron microscopy (TEM) data using image analysis software, and 2) analysis of mitochondrial presence along partially myelinated optic nerve axons using fluorescence immunohistochemistry and imaging methods. Dr. Mayoral and lab members will train the UTRA student on all techniques and analytic methods. The UTRA student will also participate in weekly lab meetings and one-on-one meetings with Dr. Mayoral. Interested students can learn more about the lab here: https://sites.brown.edu/mayorallab/.

Required qualifications: Applicants to this opportunity are expected to have successfully passed the introductory neuroscience course, NEUR 0010.

Preferred qualifications: It is preferred that applicants have also successfully passed NEUR 1020.

Modality: In person

Is this project for more than one student: No

Benjamin McDonald
Department: Chemistry, Engineering
Project Type: Research
Project Title: High Throughput Discovery of Tissue-Like Soft Materials

Project Description:
Living materials can be regarded as composite macromolecular networks permeated by fluid and cells, i.e. cell-laden hydrogels. This network is characterized by a complex and heterogenous spatial organization that spans nanometer to macroscopic length scales, from individual cells with local biomacromolecular networks to tissues and organs. It is well recognized that the surrounding three-dimensional microenvironment provides diverse array of signals that influence individual cellular processes and enable their collective functioning as coordinated living materials. Therefore, the ability to construct macromolecular networks that replicate specific combinations of physicochemical, biochemical, and mechanical stimuli is crucial to advancing the fundamental biology of healthy and diseased states and ultimately enabling therapeutic intervention. However, the exquisite and specific tailoring of these native macromolecular networks far exceed the capabilities of traditional hydrogel fabrication methods.

The McDonald lab addresses this unresolved challenge through a molecular engineering approach, investigating the relationships between macromolecular structure and assembly, and macroscopic material function. Our research focuses on translating the hierarchical features of protein structure into simplified synthetic polymers. Specifically, we seek to elucidate how chemical composition (primary

structure) and shape (tertiary structure) can be modulated to mimic the stimuli-responsive assembly mechanisms and mechanical properties of structural proteins such as tropocollagen and tropoelastin, for the fabrication of hydrogels with features tailorable to a given tissue of interest. Towards these ends, we are developing a unified high throughput platform that combines the identification of candidate polymer structures for thermal gelation into structured hydrogels with parallel in vitro cellular characterization methods to develop new model S-ECMs for the characterization of breast cancer biology. Students involved in this project will work on the synthesis of polymers as well as their characterization using automated microscopy methods.

Required qualifications: CHEM 350

Preferred qualifications: Prior chemical laboratory experience

Modality: In person

Is this project for more than one student: Yes

Benjamin McDonald
Department: Chemistry, Engineering
Project Type: Research
Project Title: Colloidal Liquid Crystalline Polymers Towards Hierarchically-Structurable Soft Materials

Project Description:
Nature's structural materials, such as wood, silk, tendon, and bone, possess mechanical strength and flexibility while being remarkably light. This array of properties has proven impossible to create in a conventional top-down materials engineering regime. Nature realizes these properties through bottom-up hierarchical ordering of rod-like fundamental building blocks, typically polysaccharides or proteins. Such ordering in these fibrillar materials occurs by the entropy-driven spontaneous arrangement in highly crowded mixtures, i.e. colloidal liquid crystallinity. A grand challenge is to synthetically recapitulate this multiscale hierarchical ordering to construct materials with programmable interactions and thus assembly.

Synthetic polymers provide the opportunity to recreate some of the vital physical and chemical features of Nature's fibrillar building blocks. Towards this, we will develop synthetic approaches towards such polymeric materials and work to define the parameters required for liquid crystalline alignment and elaboration into structured networks.

Required qualifications: Chem 350

Preferred qualifications: Prior chemical laboratory experience

Modality: In person

Is this project for more than one student: Yes

Matthew Meisel
Department: Behavioral and Social Sciences
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: 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: Preferred qualifications: Research experience (especially with human subjects) and psychology or public health coursework.

Modality: Remotely

Is this project for more than one student: No

Leenoy Meshulam
Department: Physics, Neuroscience
Project Type: Research
Project Title: Emergent Rhythms: constructing artistic display of smartphone-based system to investiagte collective behavior

Project Description:
Biological systems such as neural populations and the pigment cells on an octopus skin display striking forms of collective behavior. Many individual units, each with limited local information, coordinate to produce waves, pulses, and coherent transitions. A central question in biological physics and neuroscience is how large scale patterns arise from simple local rules, and which features of the system remain meaningful when we observe it at different levels of detail.
This project is part of Emergent Rhythms, a new artistic--scientific initiative in the Meshulam Group in

collaboration with composer Amir Shpilman. Our goal is to study collective behavior in a physical and interactive way by using synchronized smartphones as simple dynamical units. Each device can emit light, produce sound, and respond to instructions in real time. When many devices act together, they create a physical model of coordination that can be used for both artistic performance and scientific exploration.
You will help build and refine this system. Depending on interest, this can include programming local update rules that phones follow, developing timing and communication methods that allow many phones to behave coherently, or designing light and sound behaviors that reveal how structure forms across the group. These tools will support two parallel goals: studying coordination and coarse graining in a real multi unit setting, and creating immersive performance environments in which audiences experience emergence directly.

Required qualifications:
1) Proficiency in programming JavaScript / other web-based language.
2) Familiarity with interactive or creative coding environments, for example p5.js, Processing, or similar tools.
3) Comfort learning new technical frameworks and working with browser-based real-time behavior.
4) Ability to work reliably and independently within a weekly research structure.
5) Strong interest in interactive systems, collective behavior, and the intersection of art and science.

Preferred qualifications:
- Experience with front-end development (HTML, CSS, JavaScript).
- Familiarity with WebSockets, real-time communication, or timing-based interactions.
- Experience debugging across multiple devices (Android and iOS).
- Background or interest in physics of collective behavior, computational art, or multimodal performance systems.
- Experience with visual or audio programming, such as color mapping, animation timing, or simple sound triggers.
- Familiarity with GitHub or collaborative coding workflows.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Jane Metrik
Department: Center for Alcohol and Addiction Studies, School of Public Health, Behavioral and Social Sciences
Project Type: Research
Project Title: Cannabis' Impact on Alcohol Consumption (Project MARS) [This project is cross-listed with the Brown Laidlaw Scholars Program.]

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 is 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.

Modality: In person

Is this project for more than one student: No

Jane Metrik
Department: Center for Alcohol and Addiction Studies, School of Public Health, Behavioral and Social Sciences
Project Type: Research
Project Title: Cannabis Use and Driving in Daily Life (the CAR Study) [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
With expanding cannabis legalization and significant increases in cannabis-related traffic fatalities, driving under the influence of cannabis (DUIC) has become a major public health concern. Despite the impairment in driving skills and increased crash risk associated with cannabis intoxication, little is known about how individuals make the decision to drive (or not) after using cannabis. This NIH-funded research study (CAR) aims to understand decisions people make about driving when using cannabis, with real-time objective driving data collected from a GPS tracking device installed in their vehicle. The study also collects data on cannabis use in the natural environment with daily surveys completed on participants'

smartphones via ecological momentary assessment (EMA). Frequent and less frequent cannabis users (N = 260) will complete smartphone measures of cannabis use, affect, impulsivity, perceived DUIC dangerousness, driving motives and destinations, and context during a 4-week EMA period. The passively collected driving data on vehicle movement is integrated with cannabis driving reports completed by the participants to better understand decisions people make about driving after or while using cannabis in real time. The study uses mixed-methods ranging from laboratory assessment to observational field data to qualitative interviews and coding of data. The study examines types of cannabis used (e.g., THC content, formulation), subjective intoxication, personal beliefs about DUIC, and contextual influences (e.g., driving with friends, environmental conditions) that predict DUIC behaviors in daily life. Participants' personal cannabis samples are tested in our lab for THC and CBD concentration using a near-infrared spectroscopy device. Findings have important implications for cannabis policy and DUIC prevention efforts. 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 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.

Modality: In person

Is this project for more than one student: Yes

Diane Meyer
Department: Epidemiology, Pandemic Center
Project Type: Research
Project Title: Tracking and contextualizing infectious disease epidemiologic data to improve public accessibility

Project Description:
The Pandemic Center publishes a weekly newsletter, The Tracking Report, which acts as a centralized, accessible source of data related to ongoing and emerging infectious disease health security threats. The novelty of the Tracking Report is that it aggregates, interprets, and contextualizes published data relevant to disease outbreaks, going above and beyond existing dashboards and newsletters. Each week, our team meticulously reviews state, local, federal, and international data sources to contextualize information and create interactive graphics to help readers interpret trends, provoke action, and hold leaders accountable. In addition to the weekly newsletter, the Pandemic Center, as part of its Outbreak Observatory, is developing an online data dashboard to track current outbreaks, both domestic and international. This dashboard will work in tandem with the weekly newsletter, housing graphics and acting as a comprehensive source for up-to-date data and information relevant to health security threats.

The student will have the opportunity to help gather publicly available data to be used for the weekly newsletter and online data dashboard, as well as draft written material to help readers interpret current epidemiological trends. They will also be responsible for helping identify emerging outbreaks that should be featured in the newsletter/dashboard. The student may also be asked to assist with other activities relevant to the Outbreak Observatory project, including conducting qualitative studies to understand the operational lessons learned from outbreak responses, curating an online resource library of operationally focused research, and drafting content for the public (eg, blogs, videos) to raise awareness about ongoing or emerging health threats. Learning outcomes of this opportunity include building skills related to understanding the epidemiology of infectious diseases; developing research skills for public health capacity building; data collection, analysis, and interpretation; and public health communication skill-building.

Relevant links:
https://pandemics.sph.brown.edu/news/tracking-report-archive
https://www.outbreakobservatory.org/

Required qualifications: Detail oriented, independent time management, familiarity with Microsoft and Google suite, strong interpersonal skills

Preferred qualifications: Experience utilizing scientific journal databases (eg, PubMed), experience writing for different audiences

Modality: Remotely

Is this project for more than one student: Yes

Eric Morrow
Department: Molecular Biology, Cell Biology, and Biochemistry, Carney Institute for Brain Science, Neuroscience, Psychiatry and Human Behavior
Project Type: Research
Project Title: Intellectual Disability and Neurodevelopmental Genetics

Project Description:
Intellectual disability (ID) is a common neurodevelopmental disorder affecting about 1% of the global population. The Morrow Laboratory, part of the Center for Translational Neuroscience (CTN) at Brown University, investigates the genetic and cellular mechanisms that shape brain development. Using advanced genetic, molecular, and cellular approaches, the lab contributes to the CTN's mission of understanding the causes of brain disease and translating this knowledge into better outcomes for affected individuals and families.

Our research program combines hands-on wet-lab experimentation with collaborative, patient-oriented studies carried out alongside clinicians in affiliated hospital settings. Current projects focus on rare neurodevelopmental conditions such as Christianson Syndrome, GPT2 Deficiency, and 17q12 CNV disorders, as well as more common conditions such as profound autism.

We are seeking motivated undergraduate students with strong interest in human genetics, neuroscience,

and translational research to join an on-site project investigating the genetic and biological mechanisms underlying intellectual disability. Students become integrated members of the research team and receive mentorship from graduate students, postdoctoral fellows, and senior scientists.

Throughout the UTRA experience, the student will gain training in molecular, biochemical, and cellular biology techniques. Students will also learn how experiments are designed, carried out, and interpreted, with opportunities to present data at lab meetings and participate in discussions about ongoing projects. In addition, exposure to CTN seminars and collaborative meetings will help students understand how basic laboratory findings connect to clinical questions and real patient needs.

Students interested in learning more about our research areas can visit the CTN website: https://ctn.brown.edu/research

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

Preferred qualifications: Advanced course work in cell biology, molecular biology, and genetics; past work in PCR, histology, and other laboratory techniques; interest and/or past experience in developmental or intellectual disability

Modality: In person

Is this project for more than one student: Yes

Cara Murphy
Department: Behavioral and Social Sciences
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 funded by the NIH that can offer new insights to understand and address modifiable health risks. The CRESCENT Study is a project through the Brown Center for Addiction & Disease Risk Exacerbation (CADRE) that examines the effects of various nicotine products on smoking, weight, and other biomarkers of health like cortisol and inflammation. This research study recruits 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, with all training provided, including:

1. Conducting Assessments: Interview participants and guide them through key measurements.
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, and resources.
3. Research Coordination: Help arrange participant appointments, materials, and compensation.
4. Database management: Assist in updating and maintaining essential study databases.

Students will participate in MBL and CADRE meetings with the study investigator and collaborate with affiliated students and staff. Motivated students may be invited to contribute to other MBL products and

projects (e.g., conference presentations, manuscript preparation). There may also be opportunities to contribute to other collaborative research endeavors with the MBL such as projects investigating the harm-reduction potential of nicotine pouches and exploring the intersection of obesity and binge drinking. For more details about the MBL research and team, visit: https://sites.brown.edu/murphybrownlab/
For more details about the CADRE, 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: Attention to detail, strong communication and interpersonal skills, ability to work independently and as part of a team, ability to develop rapport with research participants, familiarity with Zoom, Microsoft Suite (Word, Excel, PowerPoint), Google Suite (Gmail, Google Calendar, Voice, & Drive).

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

Modality: In person

Is this project for more than one student: Yes

Lindsey Murtagh
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Law and Health Policy Research

Project Description:
Virtually no part of the U.S. health care system is untouched by law. Law plays a crucial role in shaping how health care is delivered and paid for in the U.S. It can be used as a tool to lower health care costs for individuals and to make coverage more affordable on a population level, but it can also lead to unintended consequences and act as a cost driver. Yet, despite the significant role law places in effecting health outcomes, policy makers often lack a thorough understanding of the anticipated impacts of different legal options. In this project, students will have the opportunity to work with legal researchers within Brown University School of Public Health's Center for Advancing Health Policy through Research (CAHPR) to explore several current "hot topics" in health care regulation. These topics include efforts to promote the transparency of costs for consumers, regulate predatory business practices, contain and address industry consolidation, and promote affordability for consumers. Responsibilities will be tailored to the interests of the student, but may include researching state and federal laws and policies, conducting literature reviews, and developing policy recommendations. The student will have an opportunity to work within a research team of affiliated faculty, fellows, staff, and other student research assistants in CAHPR's Health Law & Policy Lab and will also be engaged with ongoing work at CAHPR to translate health services research into policy change. Work may include engaging with government officials, drafting policy briefs, developing strategies to support CAHPR's policy work.

Required qualifications: Student has taken or is currently enrolled in PHP 330-Health Law and Policy, or has health policy academic or work experience.

Preferred qualifications: Strong writing and analytical skills.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

John Mustard
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Mars Sample Return

Project Description:
1) The mineralogy and composition of planetary surfaces can be determined using advanced remote sensing data that acquire high-spatial and -spectral resolution data. Using the vast archives of NASA data my research group has been developing advanced statistical and machine learning algorithms to innovate the methods of mineral detection on planets. My group is currently focused on the geology in the landing region of the NASA Perseverance rover. The rover is gathering samples to be returned to Earth, and our work is central to understanding the geologic of the sample. The specific project I have will entail accessing and processing of spacecraft data preparing these data for analysis with advanced algorithms. We will then apply statistical algorithms to detect the minerals from high spectral resolution data along the path of the NASA's Perseverance rover. The tasks will include acquiring data from the NASA spacecraft data repositories, organizing and preparing the data for analysis with our algorithms, applying the algorithms and analyzing the output. The validated results will then be used to address science questions concerning the geologic evolution and habitability of Mars. There is also the opportunity to incorporate a lab component in the project. Here you would acquire new data to test the algorithms on real world samples to test the precision and accuracy of the statistical and machine learning programs. This project will be collaborative with my research group, that includes graduate and undergraduate students (Mustard Lab) https://www.mustardlabgroup.com/ . The project will expose you to NASA missions, planetary science data, image processing, geological sciences and data sciences.

Required qualifications: Linear algebra, understanding of digital imaging, familiarity with computing

Preferred qualifications: Geographical Information Systems (GIS), courses in Earth, Environmental and Planetary sciences

Modality: In person

Is this project for more than one student: No

John Mustard
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Inferring Martian paleoshorelines from crater degradation signatures

Project Description:

One of the fundamental questions in Mars science is whether the planet once hosted a northern ocean. Multiple geomorphic lines of evidence suggest the presence of such an ocean, potentially outlined by preserved paleoshorelines. Like much of the Martian surface, these shorelines are surrounded by degraded, ancient impact craters. If a northern ocean existed on Mars, coastal processes should have modified these craters, leaving a distinct signature: a breached rim, marked by asymmetrical degradation, with lower elevations on the side facing the proposed paleo-ocean.

Previous work has shown that spatial degradation patterns can be used to distinguish craters modified by coastal erosion from those shaped primarily by other surface processes. Building on this foundation, this project will extend existing regional analyses to a global scale by developing and applying automated methods to quantify asymmetric crater degradation using radial topographic profiles.

The student will analyze elevation data along the proposed Martian paleoshoreline using high-resolution imagery and topographic data accessed through JMARS (Java-Mission-planning and Analysis for Remote Sensing). The student will write scripts in Python to visualize the degradation signatures from the extracted topographic data. The code developed with the student will then be used to determine the dominant orientation of the crater degradation signature. These results will be used to assess whether crater modification patterns align with predicted coastal interactions.

This project will provide hands-on experience in planetary remote sensing and scientific programming. The student will develop skills in managing large geospatial datasets, writing analytical code, and interpreting geomorphic patterns in a planetary context. They will also gain familiarity with key surface processes, including impact cratering, coastal erosion, and atmospheric-driven modification on Mars. These contributions will directly support an ongoing research effort and are expected to contribute to a publication.

Through this work, the student will build familiarity with all stages of the research process, from data analysis to scientific interpretation to dissemination of results, all while collaborating with researchers across career stages.

Required qualifications: No prior knowledge of planetary geology or experience with remote sensing data is required, as the requisite background information will be provided. Knowledge of programming in Python is required, preferably at an intermediate level.

Preferred qualifications: Prior programming / geospatial analysis experience; demonstrated coursework or interest in planetary sciences and/or surface processes.

Modality: In person

Is this project for more than one student: No

Akshay Narayan
Department: Computer Science
Project Type: Research
Project Title: Extensible Operating Systems

Project Description:
We're pursuing multiple research projects with the broader theme of operating systems extensibility, including making it easier to use eBPF to develop new extensions, to facilitating understanding network algorithms' behavior, and rethinking higher levels of the stack such as computational notebooks. Past UTRA participants in the group have co-authored research paper submissions to top systems and networking venues. See lists of some recent projects at https://systems.cs.brown.edu/publications/ and https://akshayn.xyz/.

Required qualifications: CS 300

Preferred qualifications: some upper-level systems course and/or experience writing programs in Rust

Modality: In person

Is this project for more than one student: No

Melissa Palma
Department: Medicine, Family Medicine
Project Type: Research
Project Title: TayoHelp.com: Culturally Tailored Health Education for Filipino Americans [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
TayoHelp.com provides vital, trustworthy, and culturally relevant information to help Filipinos navigate the information ecosystem. Tayo, a project of the Filipino Young Leaders Program (FYLPRO), is an innovative data hub that empowers Filipinx/a/o communities by collecting data, fostering partnerships, publishing culturally relevant insights, and developing leaders to create an equitable and sustainable future.

Tayo was developed by FYLPRO's COVID-19 Task Force in the Fall of 2020 in response to the ongoing pandemic and to tackle the specific needs of Filipinos in the diaspora and back home. Join a disciplinary team of public health physicians, behavioral health professionals, journalists, policy experts, technologists, and Filipino community members working to address Asian American health equity via community-based participatory research, health education, community engagement, and participation in our FYLPRO summer fellowship.

More information on ongoing projects listed here.
https://docs.google.com/document/d/1y6VdBA73Fef53JRhdR4st3z6E0rvERnUIZpisp67XhI/edit?usp=sharing

Required qualifications: Interest in health equity research and community health engagement.

Preferred qualifications: Willingness to learn about Filipino community, quantitative survey design, or qualitative research methods.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Irene Papanicolas
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: How long till a drug is safe? Using Real World Data to generate evidence for prescribing in clinical practice

Project Description:
We are seeking a Research Assistant to support an interdisciplinary research project that examines how long it takes for newly approved drugs to demonstrate a stable safety profile in real-world clinical practice. Physicians often face substantial uncertainty when prescribing newly approved medicines, as pre-market clinical trials are conducted in highly selected populations and are not designed to detect rare or long-term adverse events. Many important safety issues have historically emerged only after years of widespread use. This project aims to address this evidence gap by using real-world, cross-national data to estimate when post-market safety signals stabilize and when a drug can reasonably be considered "proven safe" in practice.
The Research Assistant will play a key role in collecting, organizing, and documenting regulatory safety events from major authorities, including the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA). These events include market withdrawals, black-box warnings, label changes, safety communications, and other regulatory actions taken between 1998 and 2023. Additional responsibilities will include conducting targeted literature reviews, assisting with policy mapping, and supporting preliminary descriptive analyses of international drug utilization trends.
The position offers the opportunity to contribute to an innovative project at the intersection of health policy, pharmacoepidemiology, and data science. The Research Assistant will work closely with an interdisciplinary team across Brown University, UCLA, and the University of Leuven, gaining exposure to regulatory science, comparative international data, and methods for real-world evidence generation. This role is ideal for students interested in drug safety, health systems research, regulatory policy, or data-driven approaches to improving clinical decision-making.

Required qualifications: Some skills with writing, please submit a short writing sample

Preferred qualifications: Some experience with literature review, data mapping

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Michael Paradiso
Department: Neuroscience, Carney Institute for Brain Science
Project Type: Research
Project Title: Active visual perception

Project Description:
Human vision is often studied as a passive process, but there is increasing evidence that interactions between the visual and motor systems play a critical role in visual processing. It appears that a motor signal associated with eye movements is sent to visual cortex and that this signal resets the system to analyze the scene on each new fixation of the eyes. Brain recordings in animals reveal that saccadic eye movements also make visual neurons more sensitive and their activity more independent, changes that may make visual processing faster and more efficient. The goal of this project is to quantify effects of saccadic eye movements on human visual perception. These sensory-motor interactions underlie “active visual perception.” To clarify the role of sensory-motor interactions, the experiments will use computer-controlled stimuli and an eye tracking system to quantify sensitivity to stimuli and the spatial interactions between stimuli with and without saccades. Success in this position will involve reading relevant research literature, learning how to use and program experimental hardware, recruit human subjects, and analyze experimental data.

Required qualifications: Completion of NEUR 0010, 1020, 1030, and statistics. Interest in and comfort working with computer hardware and software and human research subjects.

Preferred qualifications: Experience with computer programming such as matlab, python, psychtoolbox. Coursework on vision or perception more broadly. Data analysis.

Modality: In person

Is this project for more than one student: No

Kurt Pennell
Department: Engineering
Project Type: Research
Project Title: Synthesis of Novel Biochars to Mitigate PFAS Uptake and Leaching

Project Description:
The overall goal of this project is to develop sustainable sludge-derived biochars that are capable of retaining both long- and short-chain length PFAS in soil and water to reduce human exposure and protect the environment. Our prior work has shown that biochars strongly sorb long-chain PFAS, due to hydrophobic interactions that lead to an attractive force between the nonpolar biochar surface and the PFAS tail. Unfortunately, these same biochars also exhibit a poor ability to retain short-chain PFAS, which have a higher environmental mobility than long-chain PFAS. To overcome this limitation, we will develop methods to enrich biochar organic content and add surface charge to the non-polar adsorbent surface. The improved biochars will be evaluated in batch, column and lysimeter experiments for (1) use as soil amendments to improve soil quality and reduce potential PFAS leaching and plant uptake, and (2) as a low-cost, renewable adsorbent for point-of-use water treatment systems. Mathematical modeling of these experiments will support the development of predictive tools for design of biochar field applications and treatment systems.

Required qualifications: Laboratory Safety Training (can be completed in Spring semester), Laboratory Experience

Preferred qualifications: ENGN 490, CHEM 330

Modality: In person

Is this project for more than one student: No

Michelle Pievsky
Department: Psychiatry and Human Behavior, Pediatrics
Project Type: Research
Project Title: Evaluating the Current State of Communication Between Local Primary Care Physicians and Elementary Schools [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
When families have concerns about their child's functioning at home, school, or in the community, they may engage with and seek solutions from professionals in multiple settings. The focus of the current research project is to assess gaps in communication between primary care physicians at Hasbro Children's Hospital and Providence-area schools regarding school-related concerns and requests for support. We are specifically interested in the perspectives of school personnel (e.g., school psychologists, administrators, special education teachers, etc.) involved with 504 accommodations or special education placement for students in grades K-6. We will be using a mixed methodology called group concept mapping (GCM) to solicit input from these stakeholders. The data will be used to inform future projects related to quality improvement. The student assisting with this project may be involved in literature review, recruitment, data collection processes, and manuscript preparation. We will also plan to present outcomes to residents and attending physicians. Other opportunities include shadowing team members in primary care or developmental pediatrics as well as involvement in future lab opportunities.

This is a good opportunity for students interested in applied research within the field of pediatric psychology, interdisciplinary collaboration, and the work of psychologists in medical settings. This is also a great opportunity for students interested in applying for graduate school in psychology.

Required qualifications:
- Previous coursework in psychology or related fields
- At least one research methods course or some research exposure
- Ability to work both independently and as part of a team
- Computer access and familiarity with Microsoft and Google suites

Preferred qualifications:
- Strong written communication skills and interest in manuscript preparation
- Interest in work involving pediatric populations
- Ability to effectively communicate needs to supervisors
- Interest in learning more about K-12 schools nice but not required

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Deepti Raghavan
Department: Computer Science
Project Type: Research
Project Title: Serving and Training Compound AI Applications

Project Description:
You will work on efficient machine learning application training and serving platforms, specifically in the context of compound AI applications, which are newer machine learning applications that combine model calls and external tools (e.g., document search systems), to accomplish complex tasks.

The project will involve aspects to serve these applications efficiently (run them in a way such that the end-to-end performance is good) as well as train these applications efficiently (develop frameworks for developers to help create these applications).

Required qualifications: Coursework: cs300 required
Past experiences: Some, implementation-heavy computer science project outside of class projects (either through an internship or research experience

Preferred qualifications: Coursework: Some of the upper level systems classes in computer science: cs1390, cs1380, cs1675, cs1680, cs1670
Research experience: some computer science research experience

Modality: In person

Is this project for more than one student: No

Theresa Raimondo
Department: Engineering, Institute for Biology and Medicine (I-BEAM), Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Replicating Senolytic CARs with mRNA

Project Description:
Senescent cells can contribute to local tissue degradation and secondary senescence in surrounding cells. They are not always effectively cleared by the immune system. Recent research has explored the possible utility of senolytic CAR-T cells. We aim to partially replicate this work and encode modified senolytic CARs in mRNA, which will be delivered to macrophages and T cells. The student will work under the mentorship of a graduate student and PI Theresa Raimondo. Throughout this internship, we will have regular meetings to discuss progress and growth in student's goals and their project. There will be opportunities to present, as well as to prepare a conference poster.

Required qualifications: Communication, interest in immunoengineering and aging research, some basic

knowledge of immunology and biology

Preferred qualifications: Cell culture

Modality: In person

Is this project for more than one student: Yes

Andrea Rajsic
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Lunar Science & Public Engagement [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Are you passionate about space, science communication, and creative outreach? Join our lunar science research team this spring! We're seeking an enthusiastic undergraduate to assist with social media outreach and public engagement event planning to promote lunar and planetary science. This position offers hands-on experience in science communication, event organization, and community engagement, working directly with researchers to inspire public interest in lunar exploration.
Ideal candidates are curious, creative, organized, and enjoy connecting science with diverse audiences. Experience in navigating social media platforms and websites.
Interested? Send a brief statement of interest and resume to andrea_rajsic@brown.edu.

Required qualifications: Experience in science communication, event organization, community engagement

Preferred qualifications: completed DEEPS courses such as Earth, Moon, Mars, on any other planetary science courses.

Modality: In person

Is this project for more than one student: No

Alexander Raufi
Department: Medicine - research to be conducted in space provided by the department of pathology
Project Type: Research
Project Title: Humanized patient-derived xenograft mouse models to evaluate novel immune checkpoint inhibitor combinations for biliary tract cancers

Project Description:
Our group has previously reported that ONC212, a member of a novel class of anticancer drugs called imipridones, induces cancer cell death through various mechanisms including interactions with

mitochondrial proteases CLpP, GPR132, and GFP78/BIP. Specifically, we have shown that ONC212 is able to modulate autophagic flux and signaling via the RAS/RAF/MEK/ERK pathway in pancreatic cancer cell lines. In this project we aim to evaluate the efficacy of novel combinations of ONC212 and other immunotherapies in a humanized mouse models of biliary tract cancer (BTC).

The specific aim of this summer project is to define the impact of reconstituted human immune cells on patient-derived BTC organoid xenografts. Using the humanized mouse model developed in our lab we will xenograft patient-derived BTC organoids developed from the tumors harvested from BTC patients undergoing resection at Brown University Health. We will evaluate growth of these tumors and characterize the tumor microenvironment using quantitative multiplex immunofluorescence, immunohistochemistry, and flow cytometry. We will also test the combinations of imipridones (ONC201, ONC206, and ONC212) with novel immunotherapies.

Required qualifications: Coursework with molecular and immunological preparation:
For example: BIOL0530, CHEM0330, CHEM0350, and BIOL0500
Fundamental experience in translational and immunological experimental techniques:
For example: flow cytometry, immunohistochemistry

Preferred qualifications: Experience with rodents and/or mouse husbandry

Modality: In person

Is this project for more than one student: No

Alexander Raufi
Department: Medicine, laboratory work will be conducted in space provided by the department of pathology
Project Type: Research
Project Title: Imipridones for Chemoprevention of Colorectal Cancer

Project Description:
ONC201, a member in a class of anticancer drugs called imipridones, has previously been shown to be effective in enhancing cancer cell death through upregulating TNF-related apoptosis reducing ligand (TRAIL) and enhancing immune cell-mediated cancer cell death. This led us to explore its applications in chemoprevention for colon cancer, both in vitro and in vivo. The aim of this summer project is to analyze the mechanism of ONC201, in vitro, using adenoma-derived organoids treated with ONC201, and in vivo, using APC min/+TRAIL-/- mice. The specific aims are to (1) analyze the effectiveness of ONC201 in TRAIL knockout adenoma-derived organoids generated using CRISPR and (2) to determine ONC201's efficacy in APC min/+TRAIL-/- mice.

Required qualifications: Course work: BIOL 0530, CHEM 0330, CHEM 0350, CHEM 0360
Fundamental experience in laboratory techniques: e.g. immunohistochemical staining, cell passaging, and cell culture

Preferred qualifications: Experience with mouse husbandry/handling

Modality: In person

Is this project for more than one student: No

Maricruz Rivera-Hernandez
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Access to Care and Outcomes for Older Adults with Dementia After Migration

Project Description:
In the past 20 years, Puerto Rico has experienced rapid population aging concurrent with financial collapse, natural disasters, and outmigration of primarily younger adults. The majority of older adults generally prefer to live in their homes for as long as possible. However, older adults may need to relocate if they need care and support. This may be more common in Puerto Rico due to socioeconomic factors and the availability of support on the island. Preliminary results from our quantitative analysis using Medicare data show that older adults with dementia may be more likely to move to the U.S. mainland. Immediately following Hurricane Maria in 2017, outmigration increased among older Puerto Ricans. Therefore, the purpose of this study is to conduct interviews with key informants to understand the policies, practices, and procedures that shape how patients and caregivers navigate the migration process, as well as the barriers they face they encounter when accessing care. In addition, we hope to engage with communities to understand their approaches and experiences in supporting migrant communities navigating dementia care and supports.

Required qualifications: Strong written communication skills; able to conduct literature reviews and summarize results; Organized, flexible and able to prioritize multiple research activities; willingness to learn qualitative software.

Preferred qualifications: Qualitative skills; reading literature in Spanish; familiarity with NVivo; Course work in Public Health (qualitative data analysis) preferred.

Modality: In person

Is this project for more than one student: No

Maricruz Rivera-Hernandez
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Heat Exposure and Healthcare Needs of Older Adults in Puerto Rico

Project Description:
Over the past two decades, Puerto Rico has experienced a healthcare crisis as a result of ongoing debt challenges, shortages of healthcare workforce, and severe underfunding of essential programs. Prior results from our research has shown that older adults, individuals with multiple chronic conditions, and

people from low socioeconomic backgrounds have faced unique challenges in accessing care and receiving quality care on the island. Rising extreme temperatures on the island may pose a new threat to older adults, whose chronic conditions increase their risk of heat-related mortality. Limited research from Puerto Rico has shown that heat stress is associated with the risk of nonaccidental mortality in Puerto Rico. Older Puerto Rican adults with comorbidities may be expected to suffer extreme heat episodes, particularly in areas with higher poverty and disadvantage in Puerto Rico. Therefore, the purpose of this study is to describe the impact of these events among older adults in Puerto Rico.

Required qualifications: Strong written communication skills; able to conduct literature reviews and summarize results; statistics knowledge; organized, flexible and able to prioritize multiple research activities.

Preferred qualifications: Coursework in Public Health and/or economics preferred; programming experience; use of Stata or SAS; willingness to learn and work with big datasets.

Modality: In person

Is this project for more than one student: No

Gabriel Rocha
Department: History, Portuguese & Brazilian Studies
Project Type: Research
Project Title: Polyphonic Archives: Researching the Atlantic World of an Eighteenth-Century Newport Merchant [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
In 1752, Duarte Lopes fled Lisbon from the Inquisition. He arrived and settled in Newport, Rhode Island, following in the footsteps of family members attracted by policies of religious toleration. There, he reclaimed his Sephardic Jewish identity and took on the name Aaron Lopez. Over the next decades, he became one of the wealthiest merchants in Newport, a key player in the development of the North Atlantic economy, and a major force behind the funding and construction of Touro Synagogue. Yet Aaron Lopez was no saint. Building on preexisting Portuguese Atlantic contacts, Lopez played a direct role in orchestrating the trade in enslaved Africans between the Gold Coast and different parts of the Americas. He took a leading role in the development of whaling in Rhode Island and established a manufacturing hub for the transformation of whale byproducts into clean-burning candles to light the rooms of affluent families up and down the North American Atlantic seaboard. In this and other respects, Lopez's story embodies a deep set of contradictions that lie at the core of Revolution-era America, where promises of freedom and upward social mobility represented starkly contrasting realities confronted by people of diverse backgrounds.
Scholars know of Lopez's story thanks to his cache of personal papers, many of which are held today at the Newport Historical Society. But they have ignored a large trove of Lopez's correspondence in languages other than English – primarily, in Spanish and Portuguese. This research project, to take place at the Newport Historical Society and potentially other Rhode Island archives, will seek to identify, catalogue, and transcribe letters written to and by Aaron Lopez from such far-flung locations as Curaçao, Suriname, Puerto Rico, Haiti, Savannah, London, and Lisbon. The research will pave the way for a multi-institutional community-based research initiative over the 2026-27 academic year.

Required qualifications: Strong reading knowledge of Portuguese and/or Spanish; previous experience with research in historical archives with early modern sources; interest in Early American and Atlantic History. Please submit a short statement explaining your preparation for this archival work.

Preferred qualifications: Experience with early modern paleography; experience with research management tools such as Google Drive, Dropbox, Tropy, and similar platforms.

Modality: In person

Is this project for more than one student: No

Mauro Rodriguez
Department: Engineering
Project Type: Research
Project Title: Numerical simulations of acoustic wave-soft tissue interface interaction

Project Description:
In ultrasound imagining of soft tissues (e.g., lungs), bubbles are used to create a higher contrast. 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 an in-house code to run numerical simulations of this problem with a viscoelastic liquid. The in-house code has an existing viscoelastic model, the student shall run a 2D version of the code to compare the differences between viscoelastic-air and water-air simulations. The numerical simulations shall be run on Brown's Oscar supercomputer.

Required qualifications: Fascination with fluid mechanics, ENGN 0810, understanding of how to solve a system of ordinary differential equations (ODEs), significant knowledge of C++ or Matlab

Preferred qualifications: Written and ran ODE numerical solvers, knowledge of acoustic and/or shock waves, some working knowledge of viscoelasticity

Modality: In person

Is this project for more than one student: Yes

Jennifer Roloff
Department: Physics
Project Type: Research
Project Title: Characterization and readout 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 study novel readout systems for these sensors with various application specific integrated circuits. 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

Modality: In person

Is this project for more than one student: No

Joseph "Greg" Rosen
Department: Medicine, Behavioral and Social Sciences, Psychiatry and Human Behavior
Project Type: Research
Project Title: Human-Centered Design to Co-Create Burnout-Mitigating Interventions for Rhode Island's Frontline Harm Reduction Workforce [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
The quality of harm reduction services is attenuated by high turnover in the workforce, primarily driven by burnout. This study will be using participatory action research methods, specifically co-design methods, to create and prioritize intervention features to address and mitigate the fundamental causes of burnout in Rhode Island's frontline harm reduction workforce. Over 2 sequential, face-to-face (in Providence) co-creation workshops with ~20 frontline and managerial staff in the harm reduction workforce, we will (1) define gaps and opportunities to address burnout in this critical workforce and (2) develop and prioritize intervention prototypes to mitigate burnout in the workforce. Under the mentorship of the Principal Investigator, the identified candidate will: support recruitment and enrollment of frontline harm reduction workers across community-based organizations in Rhode Island; help facilitate and/or moderate logistics

of the co-design sessions; contribute to team-based syntheses of insights emanating from the workshops; and contribute to scientific (e.g., manuscripts, abstracts) and non-scientific (e.g., manual of prioritized intervention prototypes).

Required qualifications: (1) Interest and/or familiarity with qualitative research, specifically community-based participatory methods; (2) Comfort and/or experience with research involving marginalized communities and sensitive topics, particularly substance use and overdose.

Preferred qualifications: (1) Experience with co-design and/or workshop facilitation; (2) Familiarity or experience analyzing qualitative data.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Brenda Rubenstein
Department: Chemistry, Data Science Institute, Molecular Biology, Cell Biology, and Biochemistry, Physics
Project Type: Research
Project Title: Quantum Computing Biology and Catalysis

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: Students should have taken Introductory Biology, Physics, and Chemistry courses, including CH0330, CH0350, BIO0200, PHYS0030/0040/0050/0060/0070 or equivalent. Students should have previously programming experience.

Preferred qualifications: Students should have familiarity with Python coding. It is preferable for students to have taken quantum mechanics courses in Physics, Chemistry, or Applied Mathematics. Biochemistry courses would also be very helpful.

Modality: In person

Is this project for more than one student: Yes

Brenda Rubenstein
Department: Chemistry, Data Science Institute, Molecular Biology, Cell Biology, and Biochemistry, Physics
Project Type: Research
Project Title: Recontextualizing Science

Project Description:
Over the years, science curriculums have decontextualized the study and practice of many areas of science. Professional scientists and students are often taught the many theoretical and computational details of whole fields without knowing from where and how their fields arose, the larger societal contextualization of their fields, what funds their fields, and myriad other societal influences that shape their disciplines. In this UTRA, with the help of historians of science, we will delve into the history of how and why science became decontextualized in many modern institutions based upon primary sources with the aim of developing materials for future book chapters on the topic.

Required qualifications: Familiarity with the physical and biological sciences, expertise in obtaining and analyzing primary literature

Preferred qualifications: Expertise in science and technology studies would also be appreciated!

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Jonathan Russell
Department: Egyptology and Assyriology
Project Type: Research
Project Title: Comparative Materiality of Ancient Egyptian and Mesopotamian Medical Recipes

Project Description:
This faculty/student collaboration will develop a more refined approach for studying ancient recipes used in healing in ancient Egypt and Mesopotamia. These recipes are often composed of principal categories of interchangeable components, including materia medica such as herbs and other products, as well as additives (colouring agents, ‘divinity markers’, thickening agents, aromatics, and/or other resins and minerals) and liquid or fatty vehicles. Many of the interchangeable elements are agents used for practical purposes in technologies from other social contexts, such as fruits used as yeasting agents in brewing or

baking, or adhesive agents used in creating paint.

The student will assist the researcher in organizing data, acquiring raw materials, recreating therapeutics according to ancient recipes, and studying and recording their material properties in an organised and systematic manner (to include control groups for material variation). The student and faculty member will produce data and standardized images of the studied matter. The student's work will contribute to a larger research agenda that seeks to better understand and compare recipe structures found in Egyptian and Mesopotamian therapeutic recipe list compendia, some of which are up to 4,000 years old.

Required qualifications: At least two courses in areas related to either ancient Egyptian or Mesopotamian culture (or both)

Preferred qualifications: Knowledge of either Middle Egyptian or Akkadian (or both) is an advantage but not necessary

Modality: In person

Is this project for more than one student: No

Andrew Ryan
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Improving Value in U.S. Health Care Spending - Policy Focus

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 an undergraduate Research Assistant (RA) whose role 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 RA will work collaboratively with faculty-led teams in a dynamic environment that encourages independent thinking, problem solving, and collegiality.

Required qualifications: 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.

Preferred qualifications: N/A

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Andrew Ryan
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Improving Value in U.S. Health Care Spending - Quantitative Focus

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 an undergraduate Research Assistant (RA) whose role 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. The RA will work collaboratively with faculty-led teams in a dynamic environment that encourages independent thinking, problem solving, and collegiality.

Required qualifications: Some programming experience and working knowledge of R, Stata, SAS, Python, Tableau, SQL or comparable language is required.

Preferred qualifications: N/A

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Jennifer Sacheck
Department: Behavioral and Social Sciences
Project Type: Course Development
Project Title: Fueling Health: Nutrition & Movement for Disease Prevention - Incorporating Student Interests & Perspectives

Project Description:
Sound nutrition and regular physical activity each have independent and synergistic effects on a wide range of health outcomes and are central to chronic disease prevention. Yet most Americans fall short of meeting both the Dietary Guidelines for Americans and the Physical Activity Guidelines. At the same time, nutrition science and dietary guidance have become increasingly complex for individuals to navigate, given the constant stream of information—and misinformation—circulating online and in the media. Physical activity has similarly been engineered out of daily life through technological innovations and changing lifestyles, making it difficult for many people to achieve adequate activity without engaging in intentional, planned exercise.

Given the importance of these issues, the heightened public discourse around food, nutrition, movement, and health, and the limited number of nutrition- and movement-related courses currently offered at Brown, this project aims to gather students' perspectives to support the development of a new course that fills this curricular gap. Through this UTRA, Dr. Sacheck will collaborate with a student or team of students to advance several key objectives: (1) discuss and evaluate the appropriate balance of scientific content and public health framing for the course, including potential textbooks and readings; (2) assist in designing the course outline, determining the depth of nutrition and physiology to be covered, and identifying recent scientific articles for class discussion; (3) contribute creative ideas for course structure, including a potential flipped-classroom model, as well as assignments; (4) help develop grading rubrics; and (5) explore ideas for potential guest speakers who could enhance students' learning and engagement.

Required qualifications: Strong interest in nutrition and/or physical activity and their influence on health outcomes across the lifespan; Basic understanding of human biology and/or physiology through previous coursework

Preferred qualifications: Interest in dissecting science-based vs. media-informed information in this space; interest in helping to develop creative and informative class assignments and/or group projects

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Seda Salap-Ayca
Department: Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)
Project Type: Research
Project Title: Climate Risk Uncertainty Visualization for Pacific Island Countries and Territories
[This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Pacific Island Countries and Territories (PICTs) are among the most climate-vulnerable regions globally, remaining on the frontline of environmental impacts due to their geography. Yet, PICTs are poorly represented in the global climate models used to generate ensemble projections. Tropical Cyclones (TCs), which are major drivers of climate-related risk in the region, are not directly simulated in these models, and results often fail to align with decision making needs. Moreover, there remains significant uncertainty in ensemble outputs due to the multidimensional nature of ensemble modeling and

visualization.
This proposed summer UTRA project is a continuation of an existing effort on uncertainty visualization for Pacific Small Islands climate modeling effort. Expectations throughout the summer are twofold:

- Develop and/or supporting the data exploration interface to visualize uncertainty information in climate projections
- Generating a chatbot which will serve as a front-end step for non-expert decision makers to interact with the data. The chatbot will be (1) choosing appropriate function based on query type and scope, (2) process results with focus on key insights, uncertainty, and trends, (3) produce maps and charts based on the result of spatial analysis.

The output is expected to make it easier to ask questions and get answers from large geospatial datasets, making the process more effortless and accessible to a broader audience. It also provides an open AI framework for spatially aware chatbots that deliver not only descriptive text but also geographic insights and visualizations.

Required qualifications: Web Backend Architecture

Database management (PostgreSQL/PostGIS preferred)
Python geospatial packages (e.g., GeoPandas)

Web Frontend Architecture
React
Mapbox

Preferred qualifications: Web Backend Architecture

Familiarity with GeoJSON/JSON formats
Experience with OpenAI or similar LLM APIs

Web Frontend Architecture
Turf.js for spatial analysis

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Seda Salap-Ayca
Department: Earth, Environmental and Planetary Sciences, Institute at Brown for Environment and Society (IBES)
Project Type: Research
Project Title: Human-Centered Metrics for Land Conservation Planning [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Land conservation today requires understanding not only ecological patterns but also how benefits, risks, and vulnerabilities are experienced by different communities. Many existing conservation indicators focus

mainly on ecological criteria, leaving out important social dimensions such as uneven access to green space, disproportionate exposure to hazards, or unequal resilience to environmental change.

This project introduces a way to describe how evenly or unevenly these human-related conditions are distributed across a landscape. By adapting a spatial compactness measure to human-centered attributes(e.g. population, accessibility, or environmental burdens), we can highlight where advantages or disadvantages are concentrated, and where they are more broadly shared. Uneven patterns may signal potential inequities, while more diffuse patterns may indicate balanced access or exposures.

The project will produce open-source tools and illustrative case studies that help integrate social and ecological insights into land-conservation planning. The goal is to support decisions that advance both environmental stewardship and environmental justice, without disclosing the technical details underlying the approach.

Required qualifications: Experience with GIS or spatial data analysis
Strong analytical skills

Preferred qualifications: Familiarity with mass distribution concepts

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Brendan Saloner
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Evaluating a Novel Approach to Dispensing Methadone for Opioid Use Disorder in Carceral Facilities

Project Description:
Project description: The goal of this study is to evaluate a novel approach to providing treatment for opioid use disorder (OUD) with methadone in jails and prisons. Historically, methadone access has been highly restricted, and few facilities offer this life-saving medication across the United States. This project is composed of qualitative and quantitative aims. For our qualitative aim, we will bring together and help leaders from jails and prisons who are implementing or thinking of implementing this designation. Our quantitative aims will bring together health records to study OUD-related outcomes from Washington, Colorado, and Delaware Department of Corrections. This is a study funded by the National Institute on Drug Abuse in collaboration with Johns Hopkins University and University of Washington. We are in the beginning stages of this research, and we are looking for an undergraduate research assistant to support this project.

Primary Responsibilities:
- Help build RedCap for consent form & survey
- Help draft documents needed for administrative approvals including IRB, Departments of Corrections internal approval forms, data use agreements

Student takeaways from this role:
- Understanding of administrative and research processes for research involving incarcerated populations
- Experience using Redcap to build the “scaffolding” to set up consent and data collection procedures
- Content knowledge about opioid use addiction, medications to treat it, policy landscape that affects access to treatment, intersection of OUD and incarceration
- Be involved in a project that, in partnership with carceral systems, explores a new way to expand access to methadone behind bars
- Engage with a multi-institutional project team

Links to more info:
- RePORTER page: https://reporter.nih.gov/search/Qqb9x6VybU2B8lmm3MedEQ/project-details/11262422#description
- Project Summary: https://livejohnshopkins-my.sharepoint.com/personal/msong26_jh_edu/_layouts/15/onedrive.aspx?id=%2Fpersonal%2Fmsong26%5Fjh%5Fedu%2FDocuments%2FMinna%2FJCOIN%2DCarceral%20methadone%2FJCOIN%20project%20summary%2DBandara%2C%20Saloner%5Fshareable%2Epdf&parent=%2Fpersonal%2Fmsong26%5Fjh%5Fedu%2FDocuments%2FMinna%2FJCOIN%2DCarceral%20methadone&ga=1

Required qualifications:
- Collaborative and able to work in a team environment
- Highly motivated and detail-oriented
- Experience using Microsoft Office
- Comfort working with emails, spreadsheets, and shared folders or willingness to learn
- Strong writing skills and/or organizational skills

Preferred qualifications:
- Has taken a course in public health, ideally one with a focus on American health or criminal justice
- Interest in learning about the administrative and research processes for research involving incarcerated populations
- Research methods coursework (e.g. quantitative or qualitative)

Modality: In person

Is this project for more than one student: No

Brendan Saloner
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: The Effects of Zero Cost-Sharing on Mental Health Services Outcomes – a Qualitative Study

Project Description:

Project description: The goal of this study is to evaluate a first of its kind law requiring state-regulated insurance plans to cover for behavioral health (BH) services and treatment in New Mexico (NM). This means the insurance companies pay the full cost of BH treatments and medications, and patients enrolled in eligible plans pay nothing. This is a qualitative study in which we aim to characterize the implementation of this law from the perspectives of clinicians, insurance-related specialists, and patients in NM who are directly affected. This is a study funded by the National Institute on Mental Health in collaboration with Johns Hopkins University and the University of Minnesota. As part of this project, we are looking for an undergraduate research assistant to support this project. Your contributions will greatly help with recruiting hard-to-reach populations in NM and understanding access to care.

Primary Responsibilities:

- Assist with participant recruitment efforts (e.g., sending emails, identifying relevant people or organizations, scheduling interviews)
- Shadowing interviews and taking notes
- Provide post-interview administrative support (e.g. tracking, cleaning interview transcripts)
- Contribute to literature reviews (e.g., screening, categorizing, summarizing articles)
- Support project staff and faculty with general administrative and research tasks as needed
- Join our study team's bi-weekly meetings for this project that are held on Wednesday's from 11am-12pm EST

Student takeaways:

- Understanding the processes of qualitative research
- Experience in recruiting and being involved in helping draft a codebook
- Content knowledge on various behavioral health conditions including autism, eating disorders, substance use, etc.
- Insight on the insurance/healthcare landscape in NM

Links to more info:

- RePORTER page: https://reporter.nih.gov/search/c4lazbezTUCUdH9Czmg8Ng/project-details/10819979

Required qualifications:

- Collaborative and able to work in a team environment
- Highly motivated and detail-oriented
- Experience using Microsoft Office
- Comfort working with emails, spreadsheets, and shared folders, or willingness to learn
- Strong organizational skills

Preferred qualifications:

- Has taken a course in public health, ideally one with a focus on American health
- Knowledge of the American health care insurance system
- Background or interest in the health of disadvantaged populations and behavioral health
- Qualitative research methods coursework

Modality: In person

Is this project for more than one student: No

Neil Sarkar
Department: Medical Science
Project Type: Research
Project Title: Structuring Evidence for Alternative Drug Indications from International Regulatory Sources and Published Literature

Project Description:
Are you interested in discovering how existing medications may have valuable therapeutic uses beyond their approved indications? Many drugs receive authorization for different uses in other countries or appear in the scientific literature with evidence of alternative applications; however, this information is rarely consolidated in a way that supports research or clinical decision-making. Identifying these alternative uses can inform drug repurposing, enhance precision therapeutics, and expand treatment options for conditions with limited therapies.

This project invites undergraduate students to contribute to the development of a structured knowledge base focused on alternative drug indications derived from published literature and non-US regulatory agencies, such as those in Europe. You will help identify, extract, and organize evidence for internationally approved indications and emerging therapeutic applications reported in peer-reviewed sources, regulatory documents, and drug compendia. Using health informatics, artificial intelligence, and data science methods, you will assist in mapping these alternative indications to standardized vocabularies and organizing them into computable structures suitable for future analysis and integration into decision support systems.

Your responsibilities will include reviewing peer-reviewed literature and international regulatory resources; extracting drug-indication relationships; applying consistent, structured annotation strategies; and contributing to the representation of alternative therapeutic uses in the context of diseases, conditions, and drug classes. Students with prior programming experience will have opportunities to develop or apply computational tools, including large language models, to support automated extraction. Students with limited programming experience will focus on manual extraction, validation, and quality assurance of automated outputs. Finally, you will participate in developing approaches for aligning curated indications with contemporary clinical contexts, with particular attention to chronic and high-burden conditions.

Required qualifications:
- Strong written and verbal communication skills
- Careful attention to detail and the ability to follow structured protocols
- Demonstrated interest in health, medicine, pharmacology, or nutrition science
- Ability to read and synthesize technical and scientific materials
- Ability to work independently and meet regular deadlines

Preferred qualifications:
- Coursework or experience in health informatics, artificial intelligence, statistics, computer science, or data science
- Prior experience with literature review, annotation, or data curation
- Demonstrated ability to conduct interdisciplinary research

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Neil Sarkar
Department: Medical Science
Project Type: Research
Project Title: Structuring Traditional Chinese Medicine Food Therapies for Contemporary Health Applications

Project Description:
Are you interested in how traditional medical knowledge can advance contemporary health care? This project provides an opportunity to engage directly with Traditional Chinese Medicine (TCM), an ancient medical system that emphasizes individualized diagnosis, balance among physiological systems, and the therapeutic role of food. As part of a broader research initiative focused on bringing ancient food-based therapies into modern clinical contexts, this project centers on identifying and structuring therapeutic food relationships documented in published TCM literature.

You will extract, annotate, and organize food-based therapeutic recommendations described in scholarly and classical TCM sources that are available in English translation. The focus will be on identifying relationships between foods and targeted health concerns, especially conditions relevant to chronic disease management, such as cardiometabolic disorders, inflammatory conditions, and digestive system imbalances. Using health informatics and data science methods, you will help map these relationships to modern clinical constructs and controlled vocabularies such as SNOMED CT and FoodOn, contributing to the development of a structured knowledge base for future computational analysis and decision support.

Your responsibilities will include reviewing published TCM literature, applying standardized annotation strategies, extracting therapeutic-food condition relationships, validating terminology, and assisting in aligning extracted concepts with contemporary biomedical vocabularies. You will also contribute to the early development of an informatics pipeline that supports the systematic organization of TCM food therapy knowledge.

Required qualifications:
-Strong written and verbal communication skills
-Careful attention to detail and the ability to follow structured protocols
-Demonstrated interest in health, medicine, pharmacology, or nutrition science
-Ability to read and synthesize technical and scientific materials
-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

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Mindi Schneider
Department: Institute at Brown for Environment and Society (IBES)
Project Type: Research
Project Title: Storytelling for Environmental Justice [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Creative storytelling is a powerful way to share the everyday struggles and successes of environmental justice (EJ) mobilizations and activities. Specifically, zines and graphic novels can reach multigenerational audiences, while coloring and activity books can be crafted to appeal to youth of various ages. This is a project to gather EJ case studies for a series of creative storytelling projects. The students will collaborate with me to identify EJ mobilizations, organizations, and everyday activities in Providence (and potentially elsewhere, based on the students' interests and connections) around which to create stories for popular, open-access dissemination. Depending on the skills and interests of student assistants, they may also take part in the storytelling part of the project, including writing, drawing, storyboarding, and graphic design. The overall goal of the broader project is to work with locally-based groups to create materials (zines, coloring books, etc.) that document their work as educational resources for children and adults. By sharing stories of how people create human and more-than-human meaning, belonging, and kin - despite ongoing marginalization and injustice - the project aims to raise awareness about everyday climate and environmental struggles.

Required qualifications: (1) strong collaborative, communication, and organizational abilities, (2) familiarity with environmental justice scholarship, (3) interest and enthusiasm in creative storytelling, (4) basic on-line and case study research competences, (5) writing, illustration, or graphic design competency.

Preferred qualifications: Ideally the student has completed at least 1 course on environmental justice at Brown.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Robert Self
Department: History
Project Type: Research
Project Title: Comfort and the American Middle Class, 1945-2000

Project Description:
This Summer 2026 UTRA, entitled "Comfort and the American Middle Class, 1945-2000," is part of a

larger book project on the triumvirate of houses, cars, and children in the making of landscapes of race, housing, energy, consumption, and wealth in twentieth-century America. In past years, UTRAs related to this project have focused on housing and children, conceived through the lens of various kinds of racial and gendered labor, as well as automobility. This summer, our research will focus on how middle-class consumption became organized around concepts of comfort, ease, and convenience. In effect, we will be examining how abundance was moralized as care.

Within that frame, we will be specifically looking at home goods, especially the growing electronics and plastics industries; the rise of the credit economy to fuel middle-class consumption; and the hidden labor and production that made home-based comfort possible. The time period is roughly 1945-2000, and students will be largely using primary source material in popular culture, especially newspaper and magazines, to identify how these issues were framed, discussed, and presented to the aspiring middle class.

Required qualifications: None required

Preferred qualifications: Strong communication and organizational skills. Previous work with (at least) searchable databases of various kinds, especially academic and government. Prefer experience working with primary sources but not required.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Frank Sellke
Department: Surgery
Project Type: Research
Project Title: Study of microcirculation after cardiac surgery

Project Description:
We have found that there are marked changes in microvascular reactivity and permeability after cardiac surgery using cardioplegia and cardiopulmonary bypass. Our lab is one of the few to examine the microcirculation with an in vitro imaging apparatus. This allows us to determine changes in the absence of metabolic and auto regulatory influences.

Required qualifications: Basic background in biology and chemistry. one year course in both should be sufficient. a knowledge or biochemical techniques such as Western Blotting is an advantage.

Preferred qualifications: Having completed one year of chemistry and biology each.

Modality: In person

Is this project for more than one student: No

David Sheinberg
Department: Neuroscience, Carney Institute for Brain Science
Project Type: Research
Project Title: Is TikTok only for humans?

Project Description:
In this project, we ask if animals other than humans find inherent interest in some videos compared to others. In particular, we seek to build a deeper understanding of the visual cognitive capabilities and preferences by presenting large batteries of video clips which can be viewed in their entirety or skipped. Using these data, we will try to predict preferences for a large database of videos and features associated with these to determine what drives these preferences and how it might map onto preferences seen in human observers. Overall, the goal of the project is to obtain a more complete sense of how other animals see the world.

Required qualifications: Some computer coding experience and basic statistics and probability background; willingness to work on a team

Preferred qualifications: Familiarity with machine learning approaches for analyzing large datasets; background knowledge in cognitive science

Modality: In person

Is this project for more than one student: No

Elena Shih
Department: American Studies, Sociology
Project Type: Research
Project Title: Operation Restore Roosevelt and Policing Asian Massage Work in New York City
[This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
I am seeking research assistance for ongoing research for my second book, “The Trafficking Deportation Pipeline,” on the policing of Asian massage work as a site of human trafficking across North America. This is a community engaged research project that works closely with Red Canary Song, a grassroots coalition of migrant Asian massage workers in New York City. The summer research UTRA will assist me in parsing through hundreds of documents that RCS and I recently received from the NYC Department of Buildings (NYCDOB), following a FOIL data request for the NYCDOB communications around the 2024 Restore Roosevelt policing project. NYC Mayor Eric Adams’ Fall 2024 Operation Restore Roosevelt campaign was a 90-day long multi-agency policing effort that resulted in over 1,000 arrests of Asian migrant massage workers—and the intensification of ICE raids since Trump assumed his second presidency. My research is particularly invested in showing how policing of Asian migrant sex workers intentionally shifted from the criminal code of prostitution, to more “auxiliary” civil citation codes through the DOB. My work has argued that such policing obfuscates the racialized targeting of Asian migrant and sex workers by presenting a politically and socially palatable way of keeping low wage migrant asian women at the margins. The researcher will read through hundreds of documents that the NYCDOB has

recently handed over spanning: email correspondence, training protocols, arrest and citation records, and media reports of Operation Restore Roosevelt. The researcher will summarize, collate, and sort these files according to themes, and each week, will choose a small sample of primary source data to share with RCS outreach teams. By the end of the 12 summer weeks, the UTRA candidate will draft a 15-20 page memo that summarizes key findings in the data.

Required qualifications: Experiencing working with migrant, racial, sex work, criminal-legal, or housing justice. Experience with data analysis, drafting white-papers, comparative police research, conducting community-based research. Interest or understanding of New York City agencies, social service providers, and criminal-legal processes. Prior research engagement or partnerships with community-based advocacy organizations and stakeholders.

Preferred qualifications: Coursework in Sex and Gender Studies, Policing, and/or language skills in Mandarin Chinese, Korean, or Spanish.

Modality: In person

Is this project for more than one student: Yes

Theresa Shireman
Department: Health Services, Policy & Practice, Epidemiology
Project Type: Research
Project Title: Heat and Healthy Aging: Community Partner Engagement [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
The new Climate, Health, and Aging Innovation and Research Solutions for Communities (CHAIRS-C) is a research center that will advance science on the adverse health implications of climate events and develop actionable and equitable solutions to promote healthy aging. The conceptual underpinning of CHAIRS-C is that extreme temperature, humidity, and particulate air pollution are threats to human health, the frequency of these hazard exposures is increasing, and their impacts will disproportionately affect older adults and those with chronic health conditions. CHAIRS-C will build research capacity and connections with community partners that will drive innovations in knowledge production, policy, and practice. CHAIRS-C will support transdisciplinary collaborative teams to engage in a range of topics on climate change exposure and health impacts broadly, with special attention to older adult populations and those with chronic conditions. CHAIRS-C invites students to engage with community partners in a research oriented activity. Examples may include:

- Preparation for and adoption of age-friendly activities across RI communities
- Report on aging-related extreme temperature policies from professional &/or community organizations
- Develop materials to raise awareness of the impacts of climate change on healthy aging
- Contribute to the development of a curriculum to train and empower a cohort of elder climate advocates
- Conduct needs assessments for local organizations wanting to improve their ability to mitigate the impacts of climate change on healthy aging
- Create Rhode Island community-specific climate data reports, present to communities to aid in

priority setting and solution generation

Required qualifications: Excellent written and oral communication;

Preferred qualifications: Prior qualitative research experience

Modality: In person

Is this project for more than one student: No

Theresa Shireman
Department: Health Services, Policy & Practice, Epidemiology
Project Type: Research
Project Title: The effects of extreme heat on older adults

Project Description:
The new Climate, Health, and Aging Innovation and Research Solutions for Communities (CHAIRS-C) is a research center that will advance science on the adverse health implications of climate events and develop actionable and equitable solutions to promote healthy aging. The conceptual underpinning of CHAIRS-C is that extreme temperature, humidity, and particulate air pollution are threats to human health, the frequency of these hazard exposures is increasing, and their impacts will disproportionately affect older adults and those with chronic health conditions. CHAIRS-C will build research capacity and connections with community partners that will drive innovations in knowledge production, policy, and practice. CHAIRS-C will support transdisciplinary collaborative teams to engage in a range of topics on climate change exposure and health impacts broadly, with special attention to older adult populations and those with chronic conditions. Specific projects may include data analyses, report writing, literature reviews, and study design.

Required qualifications: Strong writing skills; good quantitative skills; oral communication

Preferred qualifications: Data analysis

Modality: In person

Is this project for more than one student: No

John Simeral
Department: Engineering, Carney Institute for Brain Science
Project Type: Research
Project Title: Software core for a high-performance embedded BCI

Project Description:
Intracortical BCIs are promising but rely on racks of computers. Over the past decade, this project has

been creating a mobile embedded platform for mobile, battery powered human BCI. This current research project involves writing high-performance C programs to process streaming neural data and validate functional and timing performance for brain-computer interface applications. Then software modules will be cross-compiled to run our custom Zynq-7000 embedded platform. Multiple processes will be optimized to run simultaneously and re-validated for real-time performance and efficient resource sharing. Students will create C modules to manage device configurations over I2C, SPI, and Linux character devices, including battery charging, a PCM1870 audio codec chip, and an LCD user interface display. Programming the LCD user interface will also involve designing a sequence of menus, including responsiveness to front-panel pushbuttons, that will enable a user to navigate the newly-created menu system for this brain-computer interface platform. Efforts will advance this state-of-the-art BCI embedded platform targeted for use by BrainGate participants. Students will develop experience with embedded hybrid hardware (FPGA tightly coupled with ARM Linux processing) and an appreciation for the unique demands programming for resource-limited embedded systems.

Required qualifications: Proficiency in C programming, compiling (gcc), and debugging; experience with C array allocation, selection of efficient numeric data types, and accessing hardware clocks in C for high-resolution timing assessment; proficiency with Linux administration through the command line; experience writing a test environment / testbench to test code functionality and timing performance.

Preferred qualifications: Familiarity with process swapping and efficient stack use in limited resource hardware, using shared memory in C, writing character devices in Linux, using FUSE / CUSE to access Linux devices, experience with GitHub.

Modality: In person

Is this project for more than one student: Yes

Prerna Singh
Department: Political Science, International and Public Affairs
Project Type: Research
Project Title: Measuring State Symbolic Power: The Cultural and Ideational Components of State Capacity

Project Description:
Project description: Measuring State Symbolic Power: The Cultural and Ideational Components of State Capacity

How do states gain citizen cooperation with their agendas and programs? A vast scholarship across the social sciences has fixated on states' use of 'sticks' (such as coercion, penalties for breaking the law, which include monetary fines and even imprisonment) and 'carrots' (for example, a range of incentives). This 'rational' repertoire of tactics is certainly important but also insufficient. States across the world and through time have relied equally and arguably, even more heavily, on a vast, relatively underemphasized but potent reservoir of cultural and ideational power to persuade and gain the cooperation of their citizens. What exactly is this 'symbolic power'? How can we operationalize it? These are the main tasks of this project.
Research assistants will work closely with me and a graduate student manager (Shreya Singh,

Department of Political Science; Fellow in the Graduate Program of Development) in the planning and creating of a data base that seeks to capture the strength of symbolic power across different states over time. We will identify and draw on a diverse range of primary and secondary historical sources to develop a coding framework for state symbolic power.

Required qualifications: None

Preferred qualifications: previous research experience is highly desirable; Statistical & coding skills (R; Stata; Python are a plus)

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Sydney Skybetter
Department: Brown Arts Institute, Theatre Arts and Performance Studies
Project Type: Research
Project Title: Choreographic Analysis of Space Colonialism and Resistance

Project Description:
This research project will develop a comprehensive digital archive documenting the intersection of dance, power structures, and space colonization narratives. Students will conduct historical research and digital humanities work to create scholarly resources examining how choreographic systems have been used as tools of colonial control and how they might be reclaimed for resistance.
The student will research and catalog historical dance notation systems (Beauchamp-Feuillet, Labanotation) and their political applications, analyze contemporary SpaceX promotional materials for choreographic elements, and create searchable database entries. Additional tasks include coding movement patterns in visual media, assisting with academic conference preparations, and contributing to content for lectures based on this material.
This research directly supports research on choreographic resistance and contributes to the emerging field of choreographic interface studies. The digital archive will serve as a foundational resource and inform my new course "How to Punch Space Nazis in Zero-G" launching Fall 2026.
If successful, this initiative will serve as a flagship demonstration of the BAI's commitment to centering student experience in institute programming and curricula. I am eager to form longitudinal relationships with UTRA students, potentially leading to teaching assistant roles, collaboration on follow-up course development, or continued engagement with BAI resources and programming.
As Director of the Brown Arts Institute, I will provide students access to the full institutional infrastructure including guest artists, arts researchers, and our instructional technology team for advanced digital humanities support. The UTRA fellows will be a part of a larger student research team that playtests methodologies including microgravity conditioning, parabolic flight preparation, and associated pedagogic practices, engaging multiple students in the research process. Students will gain valuable experience in digital humanities, archival research, and interdisciplinary scholarship while contributing to cutting-edge research on art, technology, and resistance.

Required qualifications:
Strong academic record with interest in interdisciplinary work

Basic computer literacy and willingness to learn database tools
Comfort engaging with challenging historical materials (colonialism, fascism)
Excellent written communication skills
Ability to work independently and collaboratively

Preferred qualifications:
Experience in dance/performance studies, digital humanities, media studies, or critical theory
Previous archival or research experience
Familiarity with visual analysis methods
Interest in the intersection of art and technology
Experience with data organization or coding (any level)

Modality: In person

Is this project for more than one student: Yes

Sydney Skybetter
Department: Brown Arts Institute, Theatre Arts and Performance Studies
Project Type: Course Development
Project Title: Course Development for "How to Punch Space Nazis in Zero-G: Choreographies of Resistance in the Interstellar"

Project Description:
This curriculum development project will create an innovative interdisciplinary course exploring space as a choreographic site of conquest and resistance. Students will collaborate with me to design curriculum, develop assignments, and create educational materials for this groundbreaking course launching Fall 2026.
Student tasks include researching and curating reading lists connecting dance history, space studies, and critical theory; designing scaffolded assignments from basic analysis to complex creative projects; creating study guides for challenging theoretical readings; and developing movement exercises that translate abstract concepts into embodied practice. Additional responsibilities involve prototyping creative assignments (media re-performances, collaborative experiments), designing accessibility guidelines for diverse learners, creating visual aids for choreographic analysis, and assisting with guest lecture planning.
If successful, this course will serve as a flagship demonstration of the BAI's commitment to centering student experience in institute programming and curricula. I am eager to form longitudinal relationships with UTRA students, potentially leading to teaching assistant roles in the course itself, collaboration on developing follow-up courses, or continued leadership roles within BAI programming.
As Director of the Brown Arts Institute, I will activate the full programmatic resources of the institute, including partnerships with guest artists and arts researchers for course visits, and collaboration with our instructional technology team for innovative educational materials development. The UTRA fellow will coordinate student teams to playtest pedagogic methodologies including microgravity conditioning, parabolic flight preparation, and movement-based learning approaches, ensuring broad student engagement in curriculum development. Students will gain experience in curriculum design, pedagogical theory, and innovative teaching methods while contributing to a course that culminates with selected students participating in actual zero-gravity experiments.

Required qualifications:
Strong academic record demonstrating ability to engage with complex ideas
Excellent organizational and communication skills
Enthusiasm for innovative, experimental approaches to education
Comfort with challenging subject matter (historical fascism, colonialism, trauma)
Collaborative mindset and openness to creative experimentation

Preferred qualifications:
Experience in dance/movement, critical theory, film studies, education, or creative writing
Previous involvement in course development, teaching assistance, or peer education
Interest in interdisciplinary work and unconventional pedagogical approaches
Familiarity with accessibility and inclusive education principles
Experience with event planning or project coordination

Modality: In person

Is this project for more than one student: Yes

David Sobel
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Parent-Child Interaction and Children's STEM engagement in the Wild [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Our lab has studied the relation between parent-child interaction during free play at exhibits in children's museums and children's STEM engagement and learning from those exhibits. We have found that when parents are overly directive and govern how children play at an exhibit, children might learn equally with children whose parents are more collaborative, but children with more directive parents are less engaged by the information presented to them in the exhibit (findings reviewed in Sobel, 2023). The present project presents a new collaboration between our lab and a local zoo to study children's understanding of and participation in conservation activities based on parent-child interaction during a visit. UTRA students will code existing recordings of parent-child interaction to gauge the nature of the interaction as well as follow-up tasks to examine children's understanding of conservation and their engagement with conservation activities. UTRA students will also participate in data collection and community outreach. Working with more senior members of the Causality and Mind lab (see https://sites.brown.edu/causalityandmindlab), students will visit the zoo to collect data from parents and children to then be analyzed in the lab. Students will be trained in lab and testing protocols, including how to collect data off-site and how to engage in community outreach. Students will also engage in participant recruitment, both for remote studies underway related to the project, as well as in-person laboratory-based studies related to parent-child interaction and children's STEM engagement and learning. Please note, because of the community engagement part of this UTRA, some work is done on weekends, although this is negotiable.

Required qualifications:

1) Experience working with children between the ages of 2-8.
2) At least one of CPSY0010, CPSY0610, CPSY0620, or other coursework in Developmental Psychology.
3) Friendly, outgoing personality and willingness to talk with the general public.
4) Ability to work some weekend days.

Preferred qualifications:
1) CPSY0900 or equivalent course in statistical analysis.
2) Computer Programming experience of any kind.
3) Theater experience (particularly acting or any kind of behind-the-scenes work).
4) Having access to a car.

Modality: In person

Is this project for more than one student: Yes

Alexander Sokolovsky
Department: Behavioral and Social Sciences
Project Type: Research
Project Title: Daily Remote Ecological Assessment of Cannabis and Sleep (DREAMS)

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

Modality: In person

Is this project for more than one student: Yes

Joo-Hyun Song
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Tracking cognitive effort using pupilometry

Project Description:
Ongoing research in our lab examines how pupillary changes give us insights into the cognitive states and traits of humans. In particular, we are investigating the cognitive resources that are recruited to complete behavioral tasks. There are many ways of measuring pupillary responses and it is unclear which measures are most appropriate for tracking cognitive effort. It is also important to test whether these measures only tell us about effort at a particular time in the lab (e.g., a momentary state) or whether they tell us about individual performance in general (e.g., a stable trait).

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. Further, it will provide hands-on experience in behavioral data collection with human subjects. Mentees may also gain beginner experience with programming for data cleaning and analysis as well as 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 and/or computational modeling is a plus, but not required.

Modality: In person

Is this project for more than one student: No

Joo-Hyun Song
Department: Cognitive and Psychological Sciences
Project Type: Research
Project Title: Tracking cognitive effort with EEG and pupillometry in perception-action coupling tasks.

Project Description:
Adapting motor skills is crucial to operating technology and accomplishing tasks. This adaptation depends on the integration of visual information with planned actions: visual error signals guide corrections to ongoing movements and support the formation of new motor strategies. Yet, in real-word contexts, these error signals are rarely neat or deterministic. They often contain random variability. Noisy visual feedback

may alter the cognitive effort people invest during sensorimotor adaptation, including how effectively they adjust to new tools or environments. Further, noisy error signals may influence how people form and maintain internal representations of motor actions. The overall goal of the proposed research is to develop a framework for modeling task-evoked pupillary dilation (PD) and/ or beta-band electroencephalogram (EEG) activities as proxies of cognitive effort, enabling prediction of individual differences in motor skill adaptation. This research will use well-established visuomotor paradigms to determine how visual feedback influences motor processes and their physiological correlates. Participants will perform reaching movements toward on-screen targets and will receive feedback about the correctness of their reaching movement.

The project requires students for the collection of pupillometry and/or EEG, and motor learning data. During the initial period, the student will assist the lead researcher during data collection. After the student becomes proficient with the data collection, they will also be expected to collect data, sometimes without the lead experimenter present. This way, the research team can have more flexibility in their data collection schedule and collect several participants' data per week.

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

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

Modality: In person

Is this project for more than one student: Yes

Srinath Sridhar
Department: Computer Science
Project Type: Research
Project Title: Multi-Camera Capture System for 3D Artificial Intelligence - BRown Interaction Capture System (BRICS)

Project Description:
We are looking for students to help us design, build, and maintain the next generation of multi-camera capture systems. Specifically, we have already built a system called BRICS (BRown Interaction Capture System) with 50+ cameras and microphones to record rich data about human interactions. We are not scaling this up to 300+ cameras to capture robots and humans. Students participating in this project will get exposed to the latest in hardware/software camera designs and learn.

Required qualifications: Previous experience in 3D design, 3D printing; or, experience in eletronics design; or, hardware skills; basic python/C++ programming skills

Preferred qualifications: Previous experience designing, building, and maintaining hardware. Previous experience with camera and sensor systems.

Modality: In person

Is this project for more than one student: Yes

Tracy Steffes
Department: Education, History
Project Type: Research
Project Title: Education Inc: For Profit Businesses in the History of American Education

Project Description:
This historical book project explores the development of for-profit industries around K-12 public education from the 19th century to the present. It asks questions about the causes and consequences of the growth of the for-profit sector, including its impact on public education policy and practice. The book is in early stages and I am approaching it as a series of braided case studies that delve deeply into particular products at particular moments in time but weave together into an overarching narrative about the shape of the sector. I am looking for a student researcher to help me with primary and secondary research, especially on the origins and growth of textbook publishing in the 19th century and the development of for-profit schools and educational management organizations in the late 20th century. There may be opportunities to take up other related topics of interest including standardized testing, ed tech, and educational contracting. In helping me to find and analyze primary and secondary sources, the student would likely: conduct literature reviews; identify archives and primary source bases for the project; utilize databases to find, collect, and analyze primary sources including newspapers, government records, periodicals, court cases, and published monographs. I will mentor the student on asking historical questions, identifying sources and methods for answering it, and analyzing those sources.

Required qualifications: Students must have strong reading comprehension, writing, and textual analysis skills. Students must have strong organization and communication skills and be able to work independently.

Preferred qualifications: Students will ideally have had some coursework or research experience working directly with historical primary sources.

Modality: In person

Is this project for more than one student: No

Shufang Sun
Department: Behavioral and Social Sciences, Epidemiology
Project Type: Research
Project Title: Promoting the mental health of Ukrainian youth and family [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:

Two international, collaborative projects aim 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.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Shufang Sun
Department: Behavioral and Social Sciences
Project Type: Research
Project Title: Thriving in a Digital World: A Mindfulness-Based Intervention for Healthy Smartphone Use in Adolescents [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
"Thriving in a Digital World" focuses on addressing problematic phone use (excessive use, preoccupation with the device, difficulty controlling use, and continued use despite negative consequences, etc.) and co-existing mental health concerns among adolescents in the US. The project employs a youth-centered co-design to develop an ecological momentary assessment and intervention to deliver mindfulness to disrupt the daily stress and maladaptive coping via phone use cycle, and foster resilience, sleep, and mental health. The study involves a single-arm clinical trial for a total of 40 adolescents age 13-17. We anticipate in Summer 2026 we will be enrolling participants in the study.

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

Preferred qualifications: Interest and experience in youth mental health and clinical research are strongly preferred. Skills in coordination and community organization are highly desired. Attention to detail and responsiveness are required.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Jay Tang
Department: Physics, Engineering
Project Type: Research
Project Title: Microscopic imaging of swarming and biofilm growth of bacteria on surfaces

Project Description:
Description: The Tang biophysics laboratory conducts experiments on bacteria that grow, spread, and swarm on agar surfaces. They also adhere to surfaces and form biofilms. Such processes are highly relevant to their physiological functions, and to detection and control of bacterial infections. An interested undergraduate student will be trained to grow bacteria, perform microscopic observation, and analyze images using available software such as Image-J and Cell-pose, a machine learning software. The student assistant will also be trained to model and interpret the findings, and write a scientific report of new findings under the guidance of the mentoring PI and senior PhD students. The position is available over the summer but is expected to continue through the academic year either as a part time work study project, or an independent project in research, possibly leading to a senior thesis.

Required qualifications: Applicants must be intended to concentrate in STEM, with strong interest in scientific research.

Preferred qualifications: some prior experience in laboratory work is preferred.

Modality: In person

Is this project for more than one student: Yes

Alkaterini Tavri
Department: Earth, Environmental and Planetary Sciences
Project Type: Research
Project Title: Storm-driven Antarctic sea ice drift from synthetic aperture radar imagery

Project Description:
Storms are among the most influential drivers of sea ice motion in the Antarctic Marginal Ice Zone (MIZ). Strong wind events can rapidly accelerate the ice pack, reorganize floe fields, and generate patterns of convergence and divergence that influence lead formation, wave–ice interactions, and ice export. Understanding how sea ice responds to storm forcing is essential for improving predictions of ice dynamics and for characterizing the processes that govern variability in polar regions. Yet, direct observational constraints on short-timescale storm-driven drift remain limited, especially in winter when cloud cover and darkness impede optical satellite monitoring.
This project aims to explore the impact of major storm events on Antarctic sea ice drift using Synthetic Aperture Radar (SAR) imagery. Building on a well-established pattern-tracking algorithm (Seaicedrift - Korosov et al., 2017), the UTRA scholar will use sequential SAR images to derive high-resolution drift

fields that capture ice motion over intervals of hours to days. The analysis will focus on a single Antarctic sector—such as the Weddell or Ross Sea—where multiple SAR scenes coincide with episodes of strong atmospheric forcing.
The scholar will begin by reviewing key literature on sea ice drift dynamics, storm–ice coupling, and SAR-based feature tracking. They will then identify 2–3 high-wind events using atmospheric reanalysis datasets and assemble the corresponding SAR image pairs. Using the drift algorithm, the scholar will generate spatial maps of sea ice motion and compute summary metrics such as drift speed, turning angle relative to wind, and patterns of deformation within the ice cover. Finally, the project will synthesize these results to evaluate how storms modify the motion and structure of the Antarctic MIZ, providing insights into the mechanisms linking atmospheric extremes to sea ice variability.
Through this work, the scholar will gain experience with remote sensing, geophysical data processing, and polar climate interpretation. The resulting analysis will contribute to ongoing efforts to improve observational constraints on Antarctic sea ice dynamics and to better understand the role of storm forcing in shaping polar climate processes.

Required qualifications: Some experience with Python, MATLAB, or similar coding software.

Preferred qualifications: Background in image processing, machine learning, applied mathematics, or earth system sciences.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Stefanie Tellex
Department: Computer Science
Project Type: Research
Project Title: Twitch Plays Spot: Virtual Reality Teleoperation for Human-Robot Teams

Project Description:
The aim of this project is to enable a team of people to use VR to teleoperate a team of quadruped mobile manipulator robots. Existing approaches to robot learning require demonstration datasets created by allowing humans to teleoperate robots to perform tasks in order to learn autonomous skills for performing those tasks. Our lab has created a VR teleoperation system in Unity that allows one person to control a team of two robots. In this project we will explore scaling this system in two directions. First, we will try to enable one person to control more robots. We have a total of four quadruped robots, as well as a swarm of 50 drones, and we would like to enable one person to control as many robots as possible. Second, we would like to enable a team of people to control one (or maybe two) robots, like in Twitch Plays Pokemeon. Our hypothesis is that first, this would be super awesome, and second, that a team of people will enable a larger and more diverse space of possible actions for the robot, and we will also explore user interfaces that allow people to work together collaboratively to control a single physical robot.

Required qualifications: Programming ability

Preferred qualifications: Unity, ROS, Python, C#, AI, ML, Computer Graphics experience, Robotics experience

Modality: In person

Is this project for more than one student: Yes

Stefanie Tellex
Department: Computer Science
Project Type: Course Development
Project Title: End-to-end Neural Models for Autonomous Drone Flight

Project Description:
The aim of this project is to update the Introduction to Robotics course for the modern age of end-to-end neural models. We will create a new course module that enables the drone to fly with an end-to-end neural model that controls the drone's velocity from the camera and range sensor. This will require creating a simulated model of the drone in Isaac Sim, training a neural model to control the drone via velocity control, and then distilling this model to something that can run on the Raspberry Pi, and then flying it on the real drone. We will also update other course materials in preparation for teaching Introduction to Robotics in Fall, 2026. Students who participate over the summer would ideally serve as UTAs in the fall for the updated version of the class.

Required qualifications: Python

Preferred qualifications: Robotics, drone/UAV experience, graphics, ROS

Modality: In person

Is this project for more than one student: Yes

Sarah Thomas
Department: Psychiatry and Human Behavior, Carney Institute for Brain Science
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, and whether these factors change over time. 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.

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/

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

Modality: In person

Is this project for more than one student: Yes

Jessica Tingle
Department: Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Evolution of snake musculoskeletal anatomy and function

Project Description:
Snakes have diversified to a stunning degree, such that they represent ~12% of Earth's ~34,000 terrestrial vertebrate species, and they have evolved numerous behaviors that the many other limbless vertebrates have not. The reason for their functional diversity remains murky, but it may stem in part from their complex trunk muscles, which can span numerous joints. The purpose of this project is to quantify trunk anatomy in species from across the snake family tree to better understand how the vertebral musculoskeletal system has evolved to let snakes do the huge variety of things that they do.

Students involved in this project will dissect preserved snake specimens to determine how many vertebral joints the muscles and their tendons span in different species, which can be quite variable – a single muscle-tendon unit might cross just one or two joints, or 40+ joints, depending on the muscle and species. Students will also use CT scans to determine muscle cross-sectional areas and the position of their attachment points on the bones. It may also be possible for students to study 3-dimensional vertebral shape using CT scan data. This work will improve students' knowledge of vertebrate anatomy, while also equipping them with technical skills in dissection and obtaining information from CT scans.

Required qualifications:
1. Interest in vertebrate anatomy and/or evolution
2. Willingness to engage in dissection of preserved snake specimens
3. Willingness to communicate about challenges that arise during the research process

Preferred qualifications: 1. Some biology coursework

Modality: In person

Is this project for more than one student: Yes

Jessica Tingle
Department: Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Video analysis of snakes moving on different surfaces

Project Description:
Snakes move in more than a dozen different ways, allowing them to occupy a wide variety of habitats. By studying how they adjust their movement in big or subtle ways depending on their environment, we can better understand how individuals or species can successfully navigate different habitats, which in turn can help engineers improve bio-inspired snake-like robots to carry out a variety of useful tasks. The purpose of this project is to understand how certain species change the shape of their bodies during motion across different surfaces.

Students involved in this project will process already-existing video of snakes moving. Data processing procedures could involve a combination of manual digitizing (clicking points in still frames from videos to produce XY coordinates) and troubleshooting software that uses deep learning to track animal poses.

Required qualifications:
1. Interest in biomechanics, which is a field that uses mechanical principles to better understand how

living things work
2. Willingness to work on a computer to process video data
3. Willingness to communicate about challenges that arise during the research process

Preferred qualifications:
1. Some coursework in biology and/or engineering and/or physics and/or computer science

Modality: In person

Is this project for more than one student: Yes

James Tompkin
Department: Computer Science
Project Type: Research
Project Title: Virtual Reality Teleoperation of Spot Robots

Project Description:
We are developing a system to teleoperate two Boston Dynamics Spot mobile manipulator robots in virtual reality, e.g., an operator is immersed within 3D sensor data from the robot, and can directly command the robots to move and pick up or act upon objects in the world via the virtual reality interface. The operator stands adjacent to the robots within a virtual environment, rather than seeing through any one camera on the robot, which increases spatial awareness and manipulation dexterity. However, such VR teleoperation is a grand challenge that requires the convergence of many CS and engineering disciplines. So, broadly put, the UTRA project is to work as a team to improve and evaluate the complex system of many parts. The end goal is to create effective teleoperation systems for hazardous environments, or to control robot fleets, or for learning from demonstration.

More details here:
https://cs.brown.edu/media/filer_public/b0/a3/b0a3d88c-2838-4a32-9eb3-d4eecac03f1c/janethmeraz.pdf

Required qualifications: At least one of:
Computer graphics
Computer vision
Robotics

Experience with Unity or ROS

Preferred qualifications: At least two of:
Computer graphics
Computer vision
Robotics

Systems programming experience
Networking experience

Modality: In person

Is this project for more than one student: Yes

Kimani Toussaint
Department: 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.

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:
- Previous experience in an optics lab
- ImageJ / FIJI

- CAD
- Coachability

Modality: In person

Is this project for more than one student: No

Kimani Toussaint
Department: 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, vigorous testing of different wearable health monitoring devices, use of kinematic sensors to measure force and movement, camera systems to analyze gate, contributing to the setup/build of the Sandbox space, 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

Modality: In person

Is this project for more than one student: No

Trang Tran
Department: East Asian Studies
Project Type: Course Development
Project Title: Vietnamese Quest III: Rise of the New Companions - An Expanded Gamified Adventure for VIET 300

Project Description:
Vietnamese Quest III is the next phase of the Vietnamese Quest gamified curriculum introduced in VIET 100 and VIET 200. While the previous courses introduced foundational gameplay and the central character Nam, VIET 300 expands the universe with new characters, new regions, and more complex story-based missions designed for advanced beginners transitioning to intermediate Vietnamese. Through a narrative-driven world inspired by Vietnam, students complete quests tied to the chapter themes of VIET 300:
1. Introductions & School
2. Moving & Daily Tasks
3. Community & Social Life
4. Modern Media
5. Health & Well-being
6. Traveling to Vietnam
7. Vietnamese Cuisine

Each chapter becomes a “region” on an evolving map. Students interact with new NPCs—An (foodie vlogger), Cô Linh (media expert), Bảo (health intern), and the “Language Villains”—who challenge them linguistically and culturally. The design promotes collaboration, creativity, cultural exploration, and structured linguistic progression.

Student Responsibilities
1. Design Gamified Content: story-based missions, puzzles, NPC dialogues, quizzes, role-play scenarios
2. Test and Refine Activities: conduct trial runs, revise instructions, adjust difficulty
3. Enhance Learning Outcomes: develop tools that support vocabulary retention, grammar practice, pronunciation, and cultural understanding.

Learning Goals
1. Strengthen communication at an advanced beginner/early intermediate level
2. Expand cultural literacy through embedded narratives and role-play
3. Practice real-life communicative tasks in low-stakes, engaging contexts
4. Build digital literacy using gamified tools (Quizlet, Kahoot, Padlet, Wordwall, etc.).

Required qualifications: Required Skills:
1. Interest in Vietnamese learning and/or cultural exploration
2. Strong collaborative teamwork, organizational and communication skills
3. Curiosity, creativity and openness to educational innovation.

Preferred qualifications: Preferred Skills
1. Familiarity with digital learning tools
2. Storytelling, design, or game development interest
3. Basic understanding of gamification (or willingness to learn)

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Amal Trivedi, Cyrus Kosar, David Meyers, Emily Gadbois, Emma Belanger, Momotazur Rahman
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Alzheimer's Disease and Related Disorders Treatment and Outcomes in America: Changing Policies and Systems

Project Description:
This project examines how recent national healthcare policy changes and payment reforms affect the care and outcomes of people living with Alzheimer's Disease and Related Dementias (ADRD)-a population with complex needs and significant health equity concerns. This long-standing project seeks to fill critical gaps in understanding how new Medicare and Medicaid policies, the rapid growth of Medicare Advantage, and evolving care models influence the quality and equity of ADRD care. In addition to quantitative approaches to policy and payment reform assessment and evaluation, this project has a qualitative research component that conducts interviews to understand "on the ground" perspectives and engages with patients, caregivers, providers, and payers to ensure that research findings are person-centered and actionable. Through this work, the overall project goal is to generate evidence that supports more equitable policies and higher-quality care for individuals living with ADRD.
This project is comprised of four research projects and two research cores.
Project 1 is examining how Medicare Advantage (MA) affects people living with dementia when a Medicare Advantage contract ends. This project is focused on assessing healthcare outcomes for people with dementia, what type of insurance coverage people with dementia choose after an MA plan ends, and how those choices affect their health outcomes. (Lead PI, Amal Trivedi, MD)
Project 2 explores Medicaid retention among people living with dementia across different living modalities, such as nursing homes, assisted living and home health. It will look at whether people with dementia are more likely to lose Medicaid coverage, and how healthcare providers help people with dementia stay enrolled in Medicaid. The project will also study how keeping Medicaid coverage affects health and how ending Medicaid continuous coverage policies impacts people living with dementia. (Lead PI, Cyrus Kosar, PhD)
Project 3 examines a recent innovation model by the Centers for Medicare and Medicaid Services (CMS), called the Hospice Benefit Component of the Value-Based Insurance Design (VBID). This model newly-included hospice as a benefit paid for directly by MA. Project 3 is evaluating the impact of the MA Hospice Carve-In policy on access and outcomes of persons with ADRD. (Lead PI, Emma Belanger, PhD)
Project 4 examines how a recent Medicare payment change for home health services, the Patient-Driven Groupings Model (PDGM), is affecting people living with dementia. This project is examining changes in access and use to home health for people with dementia, and how this payment change may be impacting their health outcomes. (Lead PI, Momotazur Rahman, PhD)
Core B: conducts qualitative interviews with health care setting and insurance professionals to understand "on the ground" perspectives and to ensure that research findings are person-centered and actionable. Interview topics focus on Medicare Advantage contract terminations, Medicaid retention, the VBID Hospice Carve-in, and the Patient Driven Groupings Model within Home Health. Additionally, Core B

works with the stakeholder panels to inform the work of each project. (Lead PI, Emily Gadbois, PhD) Core C: facilitates the successful completion of all projects through its methodological innovations and a novel data infrastructure that integrates information across multiple payers and care settings. Additionally, Core C works closely with the program project to maintain and update the website, LTCfocus.org. (Lead PI, David Meyers, PhD)

This project seeks up to twelve (12) undergraduate Research Assistants (RAs) to contribute to the overall project's work. Students involved in this project will help with research initiatives conducted by the projects and cores. The specific activities would be determined in partnership with the assigned project/core faculty lead depending on the work underway and the student's interests, but could include quantitative data analysis (e.g., populating and interpreting tables), qualitative data acquisition and analysis (e.g. participant recruitment, transcript de-identification, literature/media searches), conducting literature reviews, and contributing to peer-reviewed manuscripts. Students will gain experience in presenting research findings clearly, including descriptive statistics, regression results and qualitative findings.

Required qualifications:
- Interest in or familiarity with policy changes and payment reforms affecting the care and outcomes of people living with Alzheimer's disease and related dementias
- Interest in or familiarity with qualitative research methods

Preferred qualifications:
- Ability to conduct literature reviews and summarize findings
- Introductory knowledge of statistics
- Knowledge of statistical software, Google suite, and/or data visualization tools

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Areti- Angeliki Veroniki, Christopher Schmid
Department: Health Services, Policy & Practice, Data Science Institute, Biostatistics
Project Type: Research
Project Title: A Methods Scoping Review to Record All Statistical Approaches for Transforming Effect Sizes in Meta-Analysis (and Building an R package)

Project Description:
Meta-analysis is one of the most powerful techniques for evidence-based decision-making in health, public health, and policy. However, the information from studies available for combining in real-world systematic reviews often inconsistently reports effect sizes. For example, some studies may report odds ratios and others may provide risk differences or mean differences. Synthesis then requires analysts to transform the results to a common metric. These transformations—often found in methods papers, appendices, or software documentation—are essential for ensuring accurate, transparent, and reproducible evidence synthesis. Because no comprehensive, accessible collection of these formulas and methods exists, however, performing these transformations can be time-consuming and error prone. This project will conduct a scoping review to identify, classify, collate, and compare all formulas,

assumptions, and approaches used to transform one effect size into another for meta-analysis. The student will help develop a structured search strategy, screen methodological papers, extract statistical formulas, and categorize the existing approaches. The student working on this project will collaborate with two faculty mentors affiliated with the project through a structured, team-based mentoring process. Based on the findings, the team will begin developing a publicly accessible R package and Shiny App that allows researchers and other users to quickly identify the correct transformation method for their data. This work will directly support more accurate evidence synthesis and, ultimately, better health-care decisions.

Required qualifications:
- Knowledge of statistics at a level of APMA 1650/1660 or PHP 1510/1511
- Interest in quantitative research methods
- Comfort reading methodological/statistical papers
- Basic programming skills

Preferred qualifications:
- Experience with meta-analysis or evidence synthesis
- Expertise in R programming for applied statistical methods

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Tayla von Ash
Department: Behavioral and Social Sciences
Project Type: Research
Project Title: Rhode Island Teen Institute [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
Looking for a research assistant to work on a community-engaged research project called Rhode Island Teen Institute (RITI). RITI is a statewide leadership and prevention program that targets high school-aged peer leaders, whether traditional or nontraditional, from a broad range of community settings, training them in individual and community advocacy, decision-making, and interpersonal and leadership skill development. RITI reinforces leaders' commitment to a healthy lifestyle and organizes their peers to advocate for prevention in their communities. The residential training component is five days and focuses on personal skill-building in the following areas: conflict resolution, problem solving, decision making, communication, assessing high-risk behavior, and community action planning. You can learn more about RITI at https://www.riteeninstitute.org. The research assistant will focus on program evaluation (e.g., data entry, cleaning, analysis, and writing up results). They will also have the opportunity to attend/staff the program in August.

Required qualifications: Attention to detail, ability to work independently, quantitative data analysis (preferably using STATA)

Preferred qualifications: Prior experience with youth from diverse backgrounds, skills in advertising and/or

web design, past experience with teen programs and/or summer camps is a bonus :)

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Tayla von Ash
Department: Behavioral and Social Sciences
Project Type: Research
Project Title: Sleep promotion in young children

Project Description:
Sleep is an important lifestyle behavior associated with obesity and various chronic diseases. Many young children attend childcare and meet their sleep needs with naps, yet childcare is an understudied setting in pediatric sleep research. Students will work on my ongoing project examining sleep promotion in childcare and have opportunity to contribute to related analyses of observational data. Research activities will vary but may include recruitment, transcribing interview data, and conducting field observations. There are also opportunities to contribute as a co-author on manuscripts and conference abstracts.

Required qualifications: Must be willing to travel to childcare facilities throughout the state for in-person site observations/assessments. These generally occur between the hours of 12 and 3pm, so availability during these hours at least one day per week is needed.

Preferred qualifications: Attention to detail, strong writing, data analysis (familiarity with STATA and/or qualitative is a plus)

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Michael Vorenberg
Department: History
Project Type: Research
Project Title: Fortress of Servitude

Project Description:
This Research UTRA is connected to a book-in-progress about the largest long-term prison of the nineteenth-century U.S.: a massive military fort off the coast of southern Florida, on the Dry Tortugas atoll. Known by scholars today as “the Guantanamo of the Nineteenth Century,” the site was a microcosm of the distinctive arc of servitude in the United States. It was also a unique incarceral space, one missing from the voluminous scholarship on the history of American incarceration. Construction on the fort began in the 1840s by enslaved Black labor leased by the U.S. government from white enslavers in Florida; the

enslaved were held captive on the atoll by the U.S. army. During the American Civil War and Reconstruction, the fort was used as a prison for court-martialed U.S. soldiers, a disproportionate number of whom were African American. As part of their sentences, inmates continued construction of the fort. Their forced labor coincided with and mirrored the large-scale racialized convict-labor schemes in the post-Civil War U.S. South. The fort is now part of a National Park, and some information about the fort may be found at the park's website: https://www.nps.gov/drto/learn/historyculture/fort-jefferson.htm

Required qualifications: Two students will be part of the UTRA-funded research project. One of the students will work on the qualitative side of the project. This student will help choose representative inmates, research the lives of those inmates, and write up their findings as case studies that adhere to the norms of historical writing. REQUIRED qualifications for this student include experience in historical research and writing. The other student will work on the quantitative side of the project. This student will analyze and create visualizations of data already collected about the roughly 1000 Black Americans who began construction on the fort as well as the roughly 2500 Reconstruction-era inmates who served as convict laborers at the fort. REQUIRED qualifications for this student include proficiency in Microsoft Excel, including the data visualization aspects of that program.

Preferred qualifications: For the student working on the qualitative side of the project, PREFERRED qualifications include prior college-level coursework on U.S. history in the nineteenth century and experience in using research databases familiar to historians, such as JSTOR and ProQuest. For the student working on the quantitative side of the project, PREFERRED qualifications include prior creation of data visualization projects as well as some exposure to the program Tableau, or at least a willingness to become adept at the use of that program.

Modality: In person

Is this project for more than one student: Yes

Hye-Sook Wang
Department: East Asian Studies
Project Type: Research
Project Title: Story of 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 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 as well. 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, 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. This project will begin in Spring 2026 with a UTRA fellow awarded. However, I anticipate another semester work is needed to finish this project because the book is quite long (i.e. 350 pp.).

Required qualifications: Bilingual proficiency in Korean and English; some experience in academic translation

Preferred qualifications: Some background knowledge about Korean history and culture

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Jeremy Warner
Department: Medicine, Biostatistics
Project Type: Research
Project Title: HemOnc Knowledge Base [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
HemOnc.org (https://hemonc.org/) is the largest freely available medical wiki of interventions, regimens, and general information relevant to the fields of hematology and oncology. Some possible goals of the summer project are to 1) explore utilizing HemOnc in real-world data (RWD) studies, 2) enhancement of an existing regimen browser to allow users to select and visualize cancer treatment regimens from a database, and 3) to expand the existing content through semiautomated curation, extracting data from APIs, and through parsing the open access content.

Required qualifications: Some basic programming skills such as in R or Python; or familiarity with web designing including basic html.

Preferred qualifications: Interest in clinical informatics research, basic understanding of qualitative and quantitative research methodologies, creative and analytic problem-solving skills.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Jeremy Warner
Department: Medicine, Biostatistics
Project Type: Research
Project Title: The COVID-19 and Cancer Consortium (CCC19)

Project Description:
The COVID-19 and Cancer Consortium (https://ccc19.org/) is a consortium of over 120 cancer centers and other organizations that came together in March 2020 to collect data about patients with cancer who were diagnosed with COVID-19. It is the largest such registry, with 19,275 completed records as of March 31, 2023. The CCC19 has NCI U01 funding to (1) Investigate treatment exposures that may modify the short- and long-term outcomes of COVID-19 in people with cancer; (2) Measure the effects of SARS-CoV-2 infection on cancer and end-of-life trajectories; and (3) Develop methods to measure ascertainment and collider biases within the CCC19 registry.

Required qualifications: Some basic programming skills such as in R or Python; or familiarity with web designing including basic html.

Preferred qualifications: Interest in clinical informatics research, basic understanding of qualitative and quantitative research methodologies, creative and analytic problem-solving skills.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Daniel Watkins
Department: Engineering
Project Type: Research
Project Title: Understanding the seasonal cycle of Arctic sea ice

Project Description:
Sea ice is a key component of the Earth's climate system. Sea ice is a dynamic material that cracks and deforms in response to stress from wind and ocean currents. The Arctic sea ice cover modulates the exchange of energy between atmosphere and ocean. Hence, understanding sea ice physics and correctly representing ice physics in models is a critical task for realistically simulating the future state of the climate. The Arctic is a harsh environment, and long-term measurements from weather stations are only available on land. Therefore satellite observations are critical for monitoring Arctic change.

Our lab has developed a new software tool, IceFloeTracker.jl, that enables users to identify sea ice floes in satellite imagery, quantify their properties, and track their displacement and rotation from day to day. In our previous work, we have found that the floe size distribution (a statistical description of the range of sizes of individual pieces of sea ice) varies through the year. This variability is due to competing effects, such as floe fracture, landfast ice breakup, and sea ice melt. In this project, you will analyze a set of

satellite images using the IceFloeTracker software, perform quality control on the results, and quantify the variation in floe shape statistics.

Required qualifications: Familiarity with basic statistics (APMA 0650 or similar). Some familiarity with programming language(s) for data processing, e.g. Python, Matlab, R, or Julia. Willingness to learn to write code in Julia. Interest in climate and Earth observation. Students with backgrounds in applied mathematics or statistics are particularly encouraged to apply.

Preferred qualifications: Experience using the Julia programming language. Knowledge of multivariate calculus (MATH 0180/0190/0200).

Modality: In person

Is this project for more than one student: No

Daniel Weinreich
Department: Ecology, Evolution & Organismal Biology
Project Type: Research
Project Title: Evolution of Biological Noise

Project Description:
Biological noise refers to random or stochastic perturbations in an organism's phenotype. By definition, the particular perturbation realized in any organism is random, but often, the magnitude of biological noise can be influenced by the organism's DNA. That in turn means that natural selection can "tune" the amount of noise in an evolving population.

This project will explore the evolution of biological noise. The student(s) will first work with the professor to thoroughly define the model to be explored before implementing simulation code. Previously published studies are available to be built on.

We will use these simulations to examine the influence of the environment, the biology of noise, and population size on the equilibrium amount of noise observed. Because the work is computer-based, it can be performed anywhere. This project is part of a larger research program in the lab, and work completed under this SPRINT|UTRA award may result in joint authorship on a peer-reviewed publication.

Required qualifications: Solid experience programming in any language is required. This can have been acquired in a course, previous research setting, or any other environment. Confidence reading the primarily literature is also essential. Experience in theoretical biology or related discipline is also required.

Preferred qualifications: Exposure to quantitative population-based models such as those found in population genetics, ecology or epidemiology a big plus.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Lawren Wellisch
Department: Pediatrics
Project Type: Research
Project Title: Research in Pediatrics: A map of secondary data sources

Project Description:
Data used in medical research often come from large-scale databases such as national surveys, pooled electronic health records, and large longitudinal studies. The goals of this project are to identify and describe the databases most commonly used for recent published research on pediatric populations. This information will aid future researchers in identifying databases that can be used for their clinical questions and help the research community better understand where data that fuel clinical guidelines comes from. The student on this project will help with data collection by looking at articles published in pediatrics-related journals over the past 5 years and identifying which databases were used for each study, and what kind of clinical question was answered with those data. We will then compile information about accessibility and the components of each of the most common databases. This project is ideal for anyone interested in medical school, public health, epidemiology or biostatistics as students on this project will learn about health research databases used for secondary data analysis and how to access data for conducting clinical/public health research. While we will be focusing on pediatrics, skills will be applicable across many fields. Work for this project can be completed fully remotely as we will be collecting data from online articles and data sources, however we will have regular project meetings.

Required qualifications: Basic knowledge of Microsoft Excel and/or Google Sheets

Preferred qualifications: History of basic biostatistics or epidemiology coursework and/or history of reading scientific articles from medical journals. Students will NOT need to interpret or assess quality of articles in medical journals.

Modality: Remotely

Is this project for more than one student: No

Ian Wong
Department: Engineering, Pathology and Laboratory Medicine
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 30 hours a week

Modality: In person

Is this project for more than one student: No

Olivier Wouters
Department: Health Services, Policy & Practice
Project Type: Research
Project Title: Health toll associated with delayed access to essential medicines in 90 countries, 1982-2025

Project Description:
Project description: The are large global disparities in access to essential medicines. New medicines are often slow to reach poorer parts of the world, and even once available, low-income and vulnerable populations may lack broad access to these therapies.

Objective: This study aims to (1) estimate the current gap in access to essential medicines and (2) estimate the disability-adjusted life year (DALY) burden associated with lack of access to essential medicines.

Methods: Using epidemiological, clinical trial, and drug utilization data drawn from a variety of sources (including Global Burden of Disease data, peer-reviewed literature, and IQVIA), we will model the health toll associated with lack of access to medicines. This study will provide the first ever estimates of global, regional, and national DALY burden associated with lack of access to essential medicines.

Placement tasks: The student will work closely with Olivier Wouters (Brown University) and provide research assistance on this project. The tasks will include: (1) conduct a literature review of relevant studies; (2) collect global burden of disease data; and (3) collect clinical trial data on overall survival benefits associated with different drugs.

Background reading

1. Lichtenberg FR. The impact of new drug launches on life-years lost in 2015 from 19 types of cancer in 36 countries. J Demogr Economics. 2018;84(3):309–54.
2. Lichtenberg FR. How many life-years have new drugs saved? A three-way fixed-effects analysis of 66 diseases in 27 countries, 2000–2013. Int Health. 2019;11(5):403–16.

3. Wouters OJ, Kuha J. Low- and middle-income countries experienced delays accessing new essential medicines, 1982-2024. Health Affairs;43(10):1410-19.

Required qualifications: Some knowledge of pharmaceutical policy or epidemiology is essential. The post will require someone who is detail-oriented with strong organizational and time management abilities.

Preferred qualifications: N/A

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Karin Wulf
Department: History, John Carter Brown Library
Project Type: Research
Project Title: Early American Women Writers

Project Description:
As we move through the anniversaries of the American Revolution, questions about those who were marginal to the original political framework will continue to be important. A number of women writers and educators played a key role in the early United States; this project will track some of the work that one woman who founded a school did to create an early curriculum for (mostly but not entirely white) girls. I've worked on this woman's writings throughout my career; this focused effort will look at a) surviving examples (including at the JCB) of the book she published in 1786 (with a blurb from Benjamin Franklin!) and b) identify the extracts of poetry and prose it includes.

Required qualifications: Facility with basic excel; some history background with an interest in women's history and history of education.

Preferred qualifications: An interest in histories of women, politics, and education.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Karin Wulf
Department: History, John Carter Brown Library
Project Type: Research
Project Title: Brown 2026

Project Description:
Brown 2026 is a university -wide initiative from 2024-2027 to mark the 250th anniversary of United States independence. Brown 2026 has worked with students throughout the initiative, and through the UTRA

program is specifically supporting research on the university during the bicentennial (1976). This work includes oral histories (with the class of '76), and research on campus and beyond on Providence and Rhode Island during the bicentennial.

Required qualifications: Facility with excel; excellent time management and organizational skills; interest in and some background in history.

Preferred qualifications: Familiarity with Brown 2026.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

Mamiko Yajima
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Cellular and Developmental biology using the sea urchin embryo

Project Description:
Our lab studies embryonic cell fate specification through the lens of translation, metabolism, and plasticity regulation, using the sea urchin embryo as a primary model system. In this project, each student and the PI will investigate how each biological element contributes to asymmetric cell fate specification, developmental transition, and overall embryonic patterning. Through the training provided by the PI's lab, students will learn embryo handling, general microscopy, confocal microscopy, molecular biological methods, immunofluorescence, immunoblotting, and quantitative and statistical analyses.

Required qualifications: PCR, Subcloning, and general molecular biology skills; Intellectual background in Cell and Developmental Biology: Strong interest and commitment to Science.

Preferred qualifications: Microscopy (Epifluorescence and Confocal laser microscopy), Embryology, handling of RNAs

Modality: In person

Is this project for more than one student: Yes

Mamiko Yajima
Department: Molecular Biology, Cell Biology, and Biochemistry
Project Type: Research
Project Title: Computationally identifying the mechanism of Vasa function in RNA biogenesis

Project Description:
Localized mRNA translation on the mitotic apparatus is considered a crucial biological strategy: proteins

are produced and act immediately on-site for mitotic regulation and/or delivery to daughter cells with high precision. The PI's lab previously reported, in the sea urchin embryo, that Vasa is a promising factor that may regulate localized mRNA translation on the spindle. However, how and which mRNAs Vasa targets on the spindle remain unknown. To address these questions, students in the proposed project will analyze multiple omics datasets modified for Vasa expression to identify its RNA targets and potential selection mechanisms under the PI's supervision. In addition to traditional omics analyses, we will also investigate Vasa's possible role in splicing using several updated and standard splicing software tools. Through this process, students will gain experience working with RNA-seq, small RNA-seq, proteomics, and metabolomics datasets, and will further analyze motifs and splicing to explore Vasa's potential role in RNA biogenesis.

Required qualifications: Basic coding skills in R and/or Python to process raw RNA-seq, proteomics, or metabolomics datasets. Background in Cell and Developmental Biology: self-learning and motivation skills; strong interest and commitment to science.

Preferred qualifications: Experience in handling large datasets, Intellectual background in maternal to zygotic transition, small RNA regulation, Metabolism, and alternative splicing.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Hongwei Yao
Department: Medicine
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

Modality: In person

Is this project for more than one student: No

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

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.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: Yes

David Zelaya
Department: Behavioral and Social Sciences
Project Type: Course Development
Project Title: Revisiting & revising course by centering community engagement- Introduction to

Health Disparities: Making the Connection Between Structure, Social Determinants & Health Equity (PHP 400)

Project Description:
This summer UTRA will focus on revisiting and revamping my main PHP 400- Introduction to Health Disparities: Making the Connection Between Structure, Social Determinants & Health Equity. Specifically, I am interested in making the course more community engaged. The student and I will work with Sheridan center to acheive this goal. Additionally, we will work on the following: revamping the readings, the midterm, environmental scan of other similar courses, integrate the role of AI, and center more community engagement and work with non-profits.

Required qualifications: The student will be self-motivated, responsible, and hardworking.

Preferred qualifications: Ideally, the UTRA awardee has previously taken PHP 400 or taken other courses that have incorporated community engagement.

Modality: Hybrid (remote and in-person)

Is this project for more than one student: No

Milda Zizyte, Tim Nelson
Department: Computer Science
Project Type: Course Development
Project Title: Model Checking for Cyber-Physical Systems

Project Description:
We are looking for a student who is interested in exploring the intersection between cyber-physical systems and model checking. The end goal is to expand the course infrastructure of one or both of CSCI 1600 and CSCI 1710 and to investigate interesting questions in the space of model checking, such as what expressivity we lose when we try to approximate continuous systems with discrete models. You would work on a specific cyber-physical verification project that explores existing model checking tools and how well they could be adapted for similar projects in the classroom. In doing this project, you will gain skills in model checking/formal verification, the analysis of cyber-physical systems, and pedagogical design. The primary advisor for this project is Milda Zizyte (CSCI 1600), with additional advising from Tim Nelson (CSCI 1710). We are both interested in this project both because of our courses and because of our interest in modeling and verification in various domains.

Required qualifications: An ideal candidate would have taken at least one of CSCI 1600/1710. If a candidate has taken neither course, they should have taken at least one intermediate Software/Systems course (CSCI0300, 0320, or 0330) and demonstrate some sort of preparation in modeling or verification.

Preferred qualifications: A robotics/kinematics/differential equations background is a plus, but we welcome candidates who are comfortable with math and eager to pick up the background necessary to evaluate/expand existing model-checking tools.

Modality: In person

Is this project for more than one student: No

Tosca Braun
Department: Psychiatry and Human Behavior, Behavioral and Social Sciences, Religious Studies
Project Type: Research
Project Title: Integrative Wellbeing for Survivors of Violence: A Community-Engaged Study [This project is cross-listed with the Brown Laidlaw Scholars Program.]

Project Description:
This study uses community-engaged research to develop a culturally relevant 12-week yoga- and self-compassion-based healing and stigma resilience program for women survivors and victims of interpersonal violence. The program was developed to build on women's existing strengths and resilience while addressing concerns commonly cited in research with this group, including cultural relevance, stress, challenges with self-kindness or self-confidence, and/or being down or hard on oneself. Women with lived experience have played a central role from the outset of the project, from early work with women veterans to community partners and focus groups.

We are now in the final phase of the study, which involves running a randomized controlled trial that compares the program to a women's wellbeing education control group. The student research assistant working on this project will be trained in conducting phone screens and interacting with potential participants throughout the screening process, maintaining study records, and attending community events to promote the study. Students will also have the opportunity to attend ongoing community partner gatherings as part of the project and, if they wish, to develop and deliver a community workshop of their choice. There are also opportunities to analyze qualitative data and develop a research presentation. This internship will offer helpful insights and experience in a conducting community-engaged research study.

Required qualifications: Excellent time management and attention to detail, as well as communication and interpersonal skills including cultural humility and sensitivity.

Preferred qualifications: If you have an interest or experience in community-engagement, public health, psychology, and/or stigma that would be ideal. Experience with RedCAP, Box, and research is also a plus, but not required.

Modality: In person

Is this project for more than one student: Yes
