U-LINK (University of Miami - Laboratory for INtegrative Knowledge) Affiliated Doctoral Student Fellowship Program

Important Dates
- Online applications due by 11:59pm on April 16, 2021

Earliest Start Date
- June 1st, 2020

Background and Objectives: The world’s most challenging problems are usually complex. Fully addressing the issues associated with climate change, for example, requires understanding weather patterns, the relationship of health and disease to environment/diet, coastal architecture, energy policy, city planning, human behavior, truth in media, social justice, international relations, big data, and many other fields. A key goal of the University of Miami (UM) is to serve as a center of inquiry in which scholars from multiple disciplines can work together to pursue innovation, in areas where the world needs them most. UM’s diversity, found in our 11 schools and colleges, provides unique advantages for the next generation of scholars to explore and successfully address problems that span multiple disciplines.

The University of Miami Laboratory for INtegrative Knowledge (U-LINK) seeks applications from doctoral students who desire to work on such problem-based interdisciplinary scholarship with Phase II U-LINK teams.

This year, three Phase II teams are seeking applications for doctoral students to provide support on their Phase II work (see project descriptions at the bottom of this announcement):

1. Development of an early warning system for hazardous noise exposure and its health consequences
2. On the move: Climate migration and retreat in South Florida, the Caribbean, and beyond
3. AI-driven Virtual and Augmented Reality for Applied Behavior Analysis – Evaluations, Creations, and Applications

The U-LINK Doctoral Student Program is an excellent opportunity for innovative doctoral students interested in working in a dynamic, interdisciplinary environment. The fellowship is comprised of a stipend (consistent with the student’s corresponding school/college) for a 12-month period (beginning June 1 each year) plus 80% health insurance subsidy while a student is supported on a Phase II team¹. The awardee will remain the team’s doctoral fellow for as long

¹ Note that the UM student health insurance policy runs from 8/15/20-8/14/21. Awardees who begin this fellowship in June would be covered under the health insurance policy they began on 8/15/20. Awardees
as the team is funded (up to two years). That is, if the team is not supported for year two funding, the mentor is responsible for financially supporting the student. Phase II teams are funded for 12 months (starting January 1) and are eligible for a second year of funding after the completion of the first year. Note that to remain a fellow, the student must be enrolled full-time during their period of support through this fellowship, and must remain in good standing with the program.

Eligibility: The U-LINK Doctoral Student Program is intended for exceptional graduate students already enrolled full-time in a University of Miami doctoral program and highly committed to engaging in problem-based interdisciplinary scholarship. Students must be available and commit to working on the project for two years (Phase II teams can receive up to two years of funding, during which time the U-LINK doctoral student will be supported). For example, students whose graduation date is less than two years from the June 1 start date will not be eligible to serve on teams. Applicants must be currently in good standing with their graduate program.

Application Process: Candidates interested in working with Phase II teams should read the descriptions of each of the funded projects to determine if their interests and skills align with the mission of the team. If you find a team for which you’d be a good fit, fill out the online application (detailed below). You will be asked to select which of the three teams you would like to work with. Phase II teams will review applications, interview candidates (at the discretion of the teams) and select their awardee (each team will select only one U-LINK Doctoral Student).

Applications should be submitted via the InfoReady Review website at the following link: (https://miami.infoready4.com/#competitionDetail/1838087) by April 16, 2021.

To apply to the Fellowship in the InfoReady Review website, use the following steps:
1. Go to https://miami.infoready4.com
2. Log in by using your UM Single Sign-On credentials
3. Search for the "U-LINK (University of Miami - Laboratory for INtegrative Knowledge) Affiliated Doctoral Student Program 2021"
4. Select the competition
5. Click on “Submit Application” and follow the instructions on the page
6. Once you’ve completed step #4, please make sure to select “Submit Application” at the bottom of the page in order to submit your application.

Application Materials:

All materials should be submitted using the following formatting guidelines:
- Font: use common font (Helvetica, Arial, or Times New Roman) at 11pt or larger, including figure legends, footnotes and captions
- Margin: at least 0.5" each side
- Single-spaced or larger

The online application includes the following:

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can sign up for the 2021-2022 student health insurance plan in August of 2021 and have the 80% subsidy applied for Fall 2021.
1. Statement of Interest (Maximum 1,500 words).
   a. Why are you interested in working with this team? Consider addressing the following:
      i. Why is this problem of interest to you?
      ii. How would your experience or skills contribute to the team's work?
      iii. Why are you the best candidate to work on this Phase II team?

2. Statement of Potential Impact (Maximum 500 words)
   a. How would this experience impact/influence your career. In other words, how will it help you reach your career goals?

3. Letter of support from your advisor/mentor. A statement from the mentor that s/he is committed to financially supporting the student in the event that Phase II grant is not funded past year 1 is required.

4. CV
5. Unofficial graduate transcript

Evaluation Criteria:

1. Fit with the Phase II team
2. Potential for a significant contribution to the team’s work
3. Potential impact of the collaboration on the candidate’s career

Team Descriptions:

1. **Development of an early warning system for hazardous noise exposure and its health consequences**

   Team Members: Hillary Snapp, Neurotology/Otology; Suhrud Rajguru, Biomedical Engineering; Barbara Millet, Interactive Media; Natasha Solle, Medicine; Joyce Gomes-Osman, Physical Therapy; Cameron Riopelle, Richter Library

Exposures to hazardous noise causes irreversible injury to the structures of the inner ear, leading to changes in hearing and balance function with strong links to age-related cognitive impairment. Prevention of hearing loss alone can reduce dementia risk, placing hearing as a key factor in overall brain health. Despite being preventable, effective interventions and therapeutics against noise-induced hearing loss are lacking. Our Phase I preliminary results suggests that the cumulative effects of intermittent and variable noise exposure leads to early changes in the inner ear that are not evident on standard clinical assessments. Our results demonstrate a high incidence of “hidden hearing loss” and evidence of decreased neuro-vestibular function. In Phase II, we propose to fill a significant knowledge gap by characterizing the critical limits of harmful intermittent noise exposure to determine the environmental and contextual factors that contribute to early noise related changes in auditory, neuro-vestibular function, and balance. We will study these neurocognitive relationships to define sensitive diagnostics for early detection of the noise related changes. Characterization of the environment and the users are essential to our overall goal, building an early warning system (EWS) against noise overexposure for use in the general population. We will explore optimal warning strategies, optimize design and implementation of the EWS in collaboration with
Restor-Ear Devices to develop new intellectual property and Small Business Innovation Research grant proposals towards commercialization. Our long-term goal is to combine the EWS with novel therapeutics to prevent and reduce noise-induced health consequences.

2. **On the move: Climate migration and retreat in South Florida, the Caribbean, and beyond**

   Team Members: Katherine Mach, Marine Ecosystems and Society; Xavier Cortada, Art and Art History; Jessica Owley, School of Law, Ian Wright, Economics

   A staggering 28% of Florida homes at highest risk of sea level rise this century are located in Miami-Dade County alone. Miami lacks adequate safeguards for the longer-term risks. Against this backdrop, climate mobility—migration and retreat—is an emerging frontier. Our collaboration brings together climate change science, law, economics, and art to accelerate societal adaptation and resilience under increasing climate mobility threats. In Phase I, we analyzed the role of art in interdisciplinary scholarship, towards the imagination and implementation of fundamental transformations needed (manuscript in review). We are also developing (1) a law review on Miami climate migration, focusing on how art and social practice can help societies navigate climate futures and how laws and policies hinder or enable flows of climate migration, and (2) economic analysis of risk perception in Miami real estate markets, in which climate risks are not always transparent. Our Phase II project will support two grant proposals next fall (NSF Coastlines and People Focused Hub, NOAA Adaptation Science). Through societally engaged, integrative research, we will evaluate the role of art—through interviews, focus groups, and formation of a climate migration community collaborative—in shaping risk perceptions and generating creative solutions to climate mobility threats. Participant-based evaluation of art as social practice will occur through surveys of economic and well-being priorities and meaningful climate interactions. Integrated legal analysis will situate current climate mobility experiences and perceptions into a broader toolkit of future options. We will assess what policy changes can support resilient climate mobility outcomes.

3. **AI-driven Virtual and Augmented Reality for Applied Behavior Analysis – Evaluations, Creations, and Applications**

   Team Members: Hammam Alsafrjalani, Electrical and Computer Engineering; Mohamed Abdel-Mottaleb, Electrical and Computer Engineering; Anibal Gutierrez, Psychology; Yanerys Leon, Psychology; Kim Grinfeder, Interactive Media; and Vanessa Rodriguez, Libraries

   Mixed reality and AI present a unique learning environment that may transform educational and therapeutic practices. We propose to evaluate the use of augmented and virtual reality to develop a system to teach adolescents and young adults with ASD daily functional (e.g., home care task) and job (e.g., grocery inventory) skills. Specifically, using learning principles based in behavior analysis, we propose to evaluate the best methods to teach individuals to respond to programmed cues delivered by the augmented reality system. We will teach simple responses to programmed stimuli (e.g.,
pick up glowing item, place item on flashing icon, shift gaze toward sparkles / navigational cues) in a tutorial program to fluency. Once those basic responses are learned to fluency, we will evaluate the best methods to blend and re-order the cues in a manner that results in few errors and quick mastery of complex behavioral chains. We will test different consequences for correct, incorrect, and no responses (e.g., individual or combination of visual, auditory, and haptic feedback). Next, we will arrange cues in increasingly complex functional tasks. For example, we will start with a simple sorting task (i.e., sorting arbitrary items) and progress to stacking a warehouse shelf with a variety of items (e.g., cereal boxes). We will evaluate methods to incorporate AI and computer vision to identify new items or variations of items in the environment and "decide" what the appropriate cues are and program accordingly. This will allow us to test for generalization in new and unexplored environments.

For more information, please contact: Ali Mosser, Senior Manager for Research Support, amosser@med.miami.edu