Graduate Research Assistant
Position Description

The Urban Resiliency Initiative (URI), part of the Department of Comparative Human Development (CHD), seeks to hire up to six (6) part-time (10-19.5 hrs/wk) graduate research assistants to support computational tasks associated with its NIH-funded "Primed to (re)act" project. These will be remote work positions, but we will hold regular in-person group meetings that you will be expected to attend as University COVID-19 policies allow.

Project

The "Primed to (re)act" project is led by PI and CHD Prof. Margaret Beale Spencer (Director, URI) and Dr. Chris Graziul (Data Scientist, URI), applying Spencer's phenomenological variant of ecological systems theory to guide large-scale analysis of broadcast police communications.

Project members will contribute to building data science strategies grounded in a developmental perspective (i.e., social theory-based data science). The primary goal of these strategies will be to (a) improve our understanding of police behavior by studying the language law enforcement personnel use to communicate about encounters with citizens, particular male minority youth, (b) learn how to preempt/prevent biased ideation (i.e., understanding of the business problem) in data science using social theory, and (c) develop novel approaches to the processing and analysis of unstructured data vis-a-vis an archive of ~165,000 audio recordings.

The project team includes students and researchers with a variety of computational and social science backgrounds. As part of this transdisciplinary project, you _will not_ be expected to know as much as others about topics/methods outside your discipline, but you _will_ be expected to freely contribute your perspective on problems in a way that all team members can understand. To facilitate the success of this unique project we will use cutting edge approaches to deep learning (e.g., ensemble learning) as well as bleeding edge strategies for effective team science (i.e., dyadic adversarial/cooperative problem solving).

There will be opportunities for publication based on the criteria suggested by the Vancouver Convention for determining authorship. Those who meet all four criteria will be identified as authors. There will be additional opportunities for skill development associated with each task identified below. Skills include experience developing and testing deep learning models, working with unstructured (audio) data, at scale, and managing the efficient and effective use of multiple computing resources (i.e., across environments) as part of a larger data processing pipeline.

Role description and responsibilities

Research assistants will provide targeted research support for the "Primed to (re)act" project under the leadership of Dr. Graziul and in consultation with Prof. Spencer. This support includes the following responsibilities:

- Contribute to advancing at least one of the following tasks:
    - Development/testing of voice activity detection (VAD) algorithms
    - Development/testing of automatic speech recognition (ASR) models
    - Implementation of an analytic strategy for speech emotion recognition (SER)
    - Automation of ETL processes based on evolving project needs
    - Documentation of novel solutions to project-specific issues
- Collaborate with peers to complete this task (e.g., divide and conquer)
- Own your part of a task, including decisions about modeling strategy and implementation

In addition, research assistants are expected to:

- Contribute to a growing codebase associated with the project's computational tasks
- Attend regular meetings to discuss current status and planned next steps
- Communicate clearly and effectively about the details of work performed
- Communicate clearly and effectively about technical/analytic challenges encountered
- Present intermediary research products to subject matter experts or general audiences
- Assist in recruiting, training, and supervising undergraduate research assistants

Required skills/experience

- Ability to independently develop and follow a work plan based on task/project goals
- Significant experience working in a Linux computing environment (e.g., must be able to install/manage packages)
- Significant experience using Github, preferably for collaborative development
- Intermediate proficiency in Python, R, PostgreSQL, or relevant language/DBMS

Desired skills/experience

- Experience implementing deep learning models via PyTorch
- Experience processing/modeling unstructured data
- Experience working in a research team (or conducting independent research)
- Experience working in an HPC environment

Education

Bachelor's degree in computer science or relevant field, master's degree preferred, or 2+ years relevant professional experience

Compensation

$19/hr

How to apply

To apply, please send a resume, cover letter, and sample code (optional) to Dr. Graziul (graziul@uchicago.edu). Applications will be considered until all positions are filled.