

## PREP Research Associate

This position is part of the National Institute of Standards and Technology (NIST) Professional Research Experience Program (PREP). NIST recognizes that its research staff may want to collaborate with researchers at academic institutions on specific projects of mutual interest and, therefore, requires those institutions to be recipients of a PREP award. The PREP program involves staff from a wide range of backgrounds conducting scientific research across various fields. Individuals in this position will perform technical work supporting the collaboration's scientific research.

### **Research Title:**

Reference Material creation to Calibrate AI Solutions across labs

### **The work will entail:**

Overview: ITL's role in the IMS project "Distributed Manufacturing of First-In-Class NIST Traceable Active Cell Reference Materials" involves the following tasks: (1) the design and training of convolutional neural networks (CNN) for cell segmentation, cell division detection across time, and label-free cell viability assessment under different imaging modalities, and (2) the design of reference materials with which to transfer AI models across labs. Our success depends upon the availability of highly skilled domain experts. We are challenged with difficult tasks that require not only expertise in running different types of CNNs, but also in designing new architectures for applications where training data is scarce but high accuracy is paramount.

### **U.S. Citizen Preferred**

### **Key responsibilities will include but are not limited to:**

- Developing new AI architectures for cell segmentation and cell division through time.
- Creating custom built reference materials and measurement strategies to transfer the AI solutions between labs for specific cell-based assay experiments.
- Produce high-quality publications based on research and results present at internal and external meetings and conferences.

### **Qualifications**

- US citizenship is preferred.
- A PhD degree in Computer Science with 3 or more years of relevant experience.
- Expertise in Pytorch/Python and state of the Art AI models like vision transformers and advanced CNNs.
- Ability to build deployable complex software solutions for cell image analysis.
- Strong oral and written communication skills and strong presentation skills.

## Privacy Act Statement

**Authority:** 15 U.S.C. § 278g-1(e)(1) and (e)(3) and 15 U.S.C. § 272(b) and (c)

**Purpose:** The National Institute for Standards and Technology (NIST) hosts the [Professional Research Experience Program \(PREP\)](#) which is designed to provide valuable laboratory experience and financial assistance to undergraduates, post-bachelor's degree holders, graduate students, master's degree holders, postdocs, and faculty.

PREP is a 5-year cooperative agreement between NIST laboratories and participating PREP Universities to establish a collaborative research relationship between NIST and U.S. institutions of higher education in the following disciplines including (but may not be limited to) biochemistry, biological sciences, chemistry, computer science, engineering, electronics, materials science, mathematics, nanoscale science, neutron science, physical science, physics, and statistics. This collection of information is needed to facilitate administrative functions of the PREP Program.

**Routine Uses:** NIST will use the information collected to perform the requisite reviews of the applications to determine eligibility, and to meet programmatic requirements. Disclosure of this information is also subject to all the published routine uses as identified in the Privacy Act System of Records Notices: NIST-1: NIST Associates.

**Disclosure:** Furnishing this information is voluntary. When you submit the form, you are indicating your voluntary consent for NIST to use of the information you submit for the purpose stated.