

## **PREP Research Associate**

This position is part of the National Institute of Standards (NIST) Professional Research Experience (PREP) program. NIST recognizes that its research staff may wish to collaborate with researchers at academic institutions on specific projects of mutual interest, thus requires that such institutions must be the recipient of a PREP award. The PREP program requires staff from a wide range of backgrounds to work on scientific research in many areas. Employees in this position will perform technical work that underpins the scientific research of the collaboration.

**Research Title:** Physical AI Researcher

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

NIST is investigating the performance of commercial and custom AI systems (hardware and software) for Physical AI applications, specifically in machine learning, reinforcement learning, and foundation model training for Vision-Language Models (VLMs) and Vision-Language Action (VLA) architectures. The work will focus on leveraging physics-based simulations (e.g., Gazebo, MuJoCo, Drake) and synthetic data generation within platforms like NVIDIA IsaacSim / GR00T / Cosmos to conduct experiments, analyze system capabilities, and generate high-quality data to train robust Physical AI systems.

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

- Develop Physical AI applications using machine learning and reinforcement learning.
- Research and develop Foundational model training for Vision-Language Models (VLMs) and Vision-Language Action (VLA) architectures.
- Research and develop methods for synthetic data generation within platforms like NVIDIA IsaacSim / GR00T / Cosmos to conduct experiments to analyze system capabilities, and generate high-quality data to train robust Physical AI Systems.
- Write reports and develop weekly presentations to explain the progress of the project
- Work Schedule: On-campus (Gaithersburg, MD), Full-Time (40 hrs / week)

### **Qualifications**

- US Citizen Preferred
- Education: Engineering / Computer Science majors with Master's Degree or Ph.D, or in the final year of degree (e.g., Computer Science, Robotics, Mechanical Engineering or similar)
- Strong programming experience in Python and C++
- Experience in AI / Machine Learning frameworks (e.g., TensorFlow, PyTorch, etc.)
- Experience with developing and applying tools for Machine Learning, Reinforcement Learning, and Foundational Models for Vision-Language Models (VLM) and Vision-Language Action (VLA) architectures

- Experience in Synthetic data generation in and for NVIDIA IsaacSim, GROOT, and Cosmos environments
- Experience in Physics-based simulation engines (e.g., Gazebo, MuJoCo, Drake, etc.)
- Experience with version control software and workflow (e.g., Git, GitHub, GitLab, BitBucket, etc)
- Experience with Unix / Linux Operating systems
- Experience with ROS 2 on Linux systems
- Some experience in with CAD software (e.g., SolidWorks, OnShape, etc.)

### **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.