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:
Computer Scientist ZP-II/NIST GenAI program

The work will entail:
This position involves providing development support for various activities in the Information Access Division at the National Institute of Standards and Technology (NIST). Specifically, the work will support NIST GenAI evaluation series (https://ai-challenges.nist.gov/genai).
The candidate will contribute to the development of AI evaluations that support evaluation series in various modalities (such as text, voice, image, video, and code) under the NIST GenAI program. This role includes contributing to implementation of an evaluation infrastructure, designing a database schema, and performing related evaluation tasks. The candidate will also provide technical expertise in activities related to deepfakes (image, audio, and video), which include creating a project plan, developing and distributing specialized tools, generating evaluation data, and conducting evaluation series. Additionally, they will contribute to reports that align with the program's objectives. The candidate will actively participate in NIST measurement science and engage in cutting-edge research and evaluation in the field of Generative AI technologies.

U.S. citizen preferred

Key responsibilities will include but are not limited to:
- Installing, developing and deploying software for executing AI and ML based systems, with a large dataset on a GPU-accelerated cluster
- Conducting image/audio/video evaluation series in advancing generative AI technologies
- Conducting experimental design and dataset curation
- Developing baseline algorithms in generative AI
- Upgrading, maintaining, and continuously developing existing NIST GenAI software and evaluation infrastructure
- Managing data, such as querying and translating data formats/specifications
- Designing and deploying agentic AI evaluation metrics and frameworks to assess agent performance, dynamic planning, tool use accuracy, and error recovery behaviors in complex multi-step workflows as well as multi-agent systems
- Developing standardized baseline agent architectures to serve as control benchmarks within the NIST GenAI framework

Qualifications:
- Strong proficiency in a mainstream programming language used in scientific and networking domains such as Python, Java, Java Script, ruby, R, C, C++ or Rust.
- Basic proficiency with networking technologies and REST based applications

- Proficiency in shell scripting (Bash, Zsh, etc.)
- Basic proficiency with virtualization and cloud technology stacks (f.e. docker, compose, kubernetes, AWS)
- Computer Vision and Signal Processing fundamentals (f.e. audio preprocessing, morphological filters)
- Scientific Data Visualization and Analysis fundamentals
- Practical experience with agentic design patterns and modern orchestration frameworks
- Familiarity with structured output enforcement (JSON Schema), dynamic tool interfaces, and emerging interoperability standards (e.g., Model Context Protocol / MCP)
- Familiarity with agentic evaluation frameworks and benchmarks for autonomous performance
- Mastery of the principles, practices, methods in a specialty of a technical professional field (in science, computer science, software engineering, information technology, mathematics, or related field)

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.