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 wish to collaborate with researchers at academic institutions on specific projects of mutual interest and 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:
UAS Research Software Engineer

The work will entail:
The applicant who is selected for this position will be part of a team of engineers and researchers conducting research and development (R&D) activities focused on accelerating the development and deployment of real-world test methodology to evaluate communications protocols in Uncrewed Aircraft Systems (UAS) for first responder solutions.

Key responsibilities will include, but are not limited to:
- Conduct a literature review and document criteria for drone communications simulator solutions and the datasets that are used to train and test them.
- Prepare industry landscape identifying long-range communications, mesh networking, and best practices on developing methodologies of communications technologies.
- Develop a software program for a new drone communications simulator platform or to retrofit an existing platform, integrating radio hardware communications components.
- Develop open-source code and processes.
- Create and collect measurement data for the drone simulator.
- Document the dataset curation process for public use and determine the target public safety datasets and dataset enhancement options.
- Participate in public safety working groups and stakeholder testing to compare simulations with live UAS flights and curate shared information from collaborators.
- Evaluate drone simulator use cases and what datasets could be used to train and test them, as well as identify technology challenges and gaps to address.

Qualifications
- A Master's degree in Robotics, Computer Science, Artificial Intelligence, Data Science, or a related field
- Knowledge of network communications, network routing, and radio signaling
- Knowledge of robotics, UAS, or autonomous software programming (PX4, ArduPilot, AirSim, MAVLink)
- Knowledge of software engineering for virtual simulation applications
- Experience with modern AI tools and applications (AWS, GCP, Azure, MLFlow, SQL, BigQuery, Snowflake)
- Experience with development and manipulation of software code, such as Python, C, C++, Qt, JavaScript
- Knowledge of data structures, formats, and software coding curation processes
- Experience with developing open-source code, identifying use cases, and evaluating dataset quality and representativeness
- Knowledge of mathematical probability and statistics, and optimization methods
- Knowledge of machine learning, including supervised and unsupervised learning, deep learning, and model evaluation
- Knowledge of dataset biases and labeling issues
- Knowledge of translating operational needs into solvable radio signal or networking problems
- US Citizens Preferred

17-2072.00 Electronics Engineers, Except Computer

Research, design, develop, or test electronic components and systems for commercial, industrial, military, or scientific use employing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls.

Sample of reported job titles: Compatibility Test Engineer, Design Engineer, Electronics Design Engineer, Engineer, Evaluation Engineer, Integrated Circuit Design Engineer (IC Design Engineer), Product Engineer, Radio Frequency Engineer (RF Engineer), Research and Development Engineer (R and D Engineer), Test Engineer

15-1252.00 Software Developer

Research, design, and develop computer and network software or specialized utility programs. Analyze user needs and develop software solutions, applying principles and techniques of computer science, engineering, and mathematical analysis. Update software or enhance existing software capabilities. May work with computer hardware engineers to integrate hardware and software systems, and develop specifications and performance requirements. May maintain databases within an application area, working individually or coordinating database development as part of a team.

Sample of reported job titles: Application Developer, Application Integration Engineer, Developer, DevOps Engineer (Development Operations Engineer), Infrastructure Engineer, Software Architect, Software Developer, Software Development Engineer, Software Engineer, Systems Engineer

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.