

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-I/Software Engineer (Guardians of Forensic Evidence Project)]

The work will entail:

[We are seeking a senior undergraduate or graduate student with strong software engineering skills to support the Guardians of Forensic Evidence Initiative—an effort to strengthen the scientific reliability of AI-based deepfake detection systems used in forensic and judicial contexts.]

This role emphasizes AI related software development, evaluation pipeline implementation, AI system benchmarking infrastructure, and web platform development. The selected candidate will contribute directly to the development of the Deepfake Challenge Kit, including dataset management systems, scoring packages, and a secure evaluation website with user authentication and leaderboard functionality.]

U.S. Citizen Preferred

Key responsibilities will include but are not limited to:

- **Deepfake and Synthetic Data Generation** and Automated Benchmarking Dataset Pipeline Development, including but not limited to: developing automated or semi-automated state-of-the-art deepfake image/audio generation pipelines; implementing metadata handling and dataset validation tools; building infrastructure for deepfake media benchmarking; etc.
- **Deepfake Analytic AI System Implementation:** Implement baseline deepfake detection algorithms; design modular, well-documented, and maintainable codebases; deploy deepfake detection tools on Linux servers and GPU clusters; ensure reproducibility and performance optimization; maintain cross-platform compatibility (Linux, macOS, Windows); implement containerized solutions (Docker-based workflows) as needed.
- **Scoring Package & Evaluation Infrastructure:** Implement evaluation metrics (ROC curves, AUC, confusion matrices, robustness analysis); develop reproducible evaluation pipelines; conduct quantitative performance analysis across different data subsets.
- **Web Platform Development:** Design, implement, and maintain a secure, scalable evaluation web platform that includes a user authentication system (login, registration, role-based access control), a dataset release portal with controlled access, and an admin dashboard for dataset and user management. The technology stack may include (but is not limited to) Python, React or modern JavaScript frameworks, PostgreSQL, Docker, and Linux-based deployment environments.

Qualifications

This individual must have the following **minimum** knowledge, skills, and abilities:

- Senior undergraduate or graduate student in Computer Science, Software Engineering, or a related field
- Strong proficiency in Python to support timely project delivery
- Experience working in a Linux environment and with shell scripting (Bash) is required
- Background in media (audio, image, or video) processing and analysis
- Ability to work independently as well as in collaborative research environments

Furthermore, the following knowledge skills, and abilities are preferred:

- GPU programming or AI model development experience
- Experience with web development (HTML, CSS, JavaScript)
- Experience developing backend services (Flask, Django, FastAPI, Node.js, etc.)
- Previous experience with generative AI tools, including deepfake technologies and large language models
- Experience in cross-platform software development (Linux, macOS, Windows)
- Experience or interest in machine learning and AI system testing and evaluation
- Experience with database management (e.g., PostgreSQL)
- Experience with Jupyter Notebooks, R, Shiny, and interactive data visualization

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.