

Statistical Software Development for the Illicit Drug Landscape
(U.S. Citizenship Preferred)

Overview

This position supports an ongoing, interdisciplinary effort within the National Institute of Standards and Technology (NIST) to gain insights from data collected as part of the Rapid Drug Analysis and Research (RaDAR) program. NIST collaborates with public health and public safety stakeholders across the U.S. to analyze real-time data regarding the chemical makeup of illicit drugs. Because this landscape is opaque and rapidly evolving, the team is developing novel statistical and computational tools to model usage patterns, detect emerging trends, and surface analytical insights for stakeholders.

The successful candidate will focus primarily on software development for data science and statistical applications, with an emphasis on building and maintaining an interactive R Shiny web application (or similar tooling) that enables analysts and external stakeholders to explore and answer their own questions about drug compound data. The role also includes contributing to the implementation of statistical methods for projects that arise, such as detecting previously unobserved compounds and emerging trends. This is well-suited to a master's-level scientist who enjoys translating statistical and scientific requirements into robust, usable software.

Duties include but are not limited to:

- **Dashboard Development:** Design, build, and maintain a production-quality R Shiny application that allows non-statistical users to interactively query, visualize, and interpret high-dimensional drug compound data. Translate stakeholder analysis questions into reusable interface components and workflows.
- **Software Engineering Practices:** Develop modular, well-documented, and maintainable R code. Implement reactive data pipelines that remain performant on large, frequently updated datasets.
- **Method Implementation:** Collaborate with statisticians to implement and operationalize analysis methods—including approaches for detecting emerging or previously unobserved compounds—as tested, reusable functions and dashboard features.
- **Data Analysis & Visualization:** Conduct exploratory data analysis, data provenance and quality evaluation, and create publication- and presentation-quality visualizations (e.g., ggplot2, plotly) to support both the dashboard and team research.
- **Collaboration & Communication:** Work closely with statisticians, chemists, and public health stakeholders to gather requirements, iterate on tools, and present software capabilities and analytical findings to technical and non-technical audiences.

Required Skills, Expertise and Qualifications

- Master's degree in Statistics, Biostatistics, Data Science, Computer Science, or a related quantitative field.
- Strong programming proficiency in R, including demonstrated experience developing R Shiny applications.

- Experience with software development best practices: version control (Git), modular code organization, documentation, and testing.
 - Working knowledge of statistical concepts sufficient to collaborate effectively with statisticians and to implement analytical methods correctly.
 - Proficiency in data manipulation and visualization in R (e.g., tidyverse).
 - Familiarity with reactive programming patterns and performance optimization for interactive applications is desirable.
 - Exposure to spatial, temporal, or spatio-temporal data, or to anomaly/novelty detection methods is a plus.
 - Experience or interest in applying analytical tools to public health, chemistry, forensic science, or epidemiological data.
- Experience communicating technical ideas and tools to non-technical users.

Employment Terms: This opportunity is to be an associate researcher in the NIST Statistical Engineering Division for a term of 1 year, with options to renew and/or pursue longer-term federal employment. Associate researchers are NOT Federal Employees, but they work aside NIST researchers. Relocation expenses will not be provided.

Salary: \$80,000-\$85,000

How to express interest: Interested candidates, U.S. Citizens preferred, who meet all of the required qualifications are invited to express their interest in the position by sending an updated CV to Julia Sharp at julia.sharp@nist.gov or apply at <https://engineering.gwu.edu/gwu-prep-job-opportunities>.