

Statistical Models and Computational Algorithms for Nanoparticle Tracking Analysis (U.S. Citizenship Preferred)

Overview

The Information Technology Laboratory of the National Institute of Standards and Technology (NIST) is seeking qualified candidates, U.S. citizenship preferred, to collaborate with a team of world-class statisticians and metrologists to complete the ongoing development of statistical models and computational algorithms for nanoparticle tracking analysis. The main goal of this research project is to optimize the accuracy and precision of this emerging method to measure the dimensional and optical properties of single nanoparticles with high throughput, advancing fundamental metrology of nanoparticle standards and samples, and supporting critical and emerging technologies. The successful candidate will have the opportunity to master the application of statistical thinking and modeling to physical science problems as well as communicating with non-statistician scientists.

Duties include but are not limited to:

- Creating statistical models, primarily a Bayesian framework, and computational algorithms in support of metrology goals
- Processing micrographs and reducing data in support of statistical modeling, including the creation of custom computational algorithms for processing as necessary
- Performing molecular dynamics simulations in support of statistical modeling
- Processing large data sets in high-performance computing environments
- Communicating with non-statisticians using descriptive statistics and graphical displays

Required Skills, Expertise and Qualifications

- A Ph.D. in statistics or a related area of academic study
- Experience with nanoparticle tracking analysis
- Experience processing and localizing sub-resolution structures in optical and atomic-force micrographs
- Experience with optical and atomic-force microscope calibration
- Experience with statistical, including Bayesian, modeling
- Experience with optimization, Monte Carlo, and Markov Chain Monte Carlo algorithms
- Experience with Large-scale Atomic/Molecular Massively Parallel Simulator (LAMMPS)
- Experience creating Gaussian process computer-model surrogates
- Experience with high-performance computing
- Strong communication skills in speaking, writing, and graphical display

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 as NIST researchers. Relocation expenses will not be provided.

Salary: \$100,000 to \$110,000

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.