Opportunity Title: USDA-ARS Postdoctoral Fellowship in Developing New Methods for Petabyte-scale Sequence Search
Opportunity Reference Code: USDA-ARS-2022-0131

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2022-0131

How to Apply

Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

A complete application consists of:

- An application
- Transcript(s) – For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. All transcripts must be in English or include an official English translation. Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations

All documents must be in English or include an official English translation.

Application Deadline 2/16/2024 3:00:00 PM Eastern Time Zone

Description

***Applications will be reviewed on a rolling-basis and this posting will remain open until filled.**

ARS Office/Lab and Location: A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Genomics and Bioinformatics Research Unit in Gainesville, Florida. Other locations for the appointment are also possible.

The U.S. Department of Agriculture - Agricultural Research Service (USDA ARS) mission involves problem-solving research in the widely diverse food and agricultural areas encompassing plant production and protection; animal production and protection; natural resources and sustainable agricultural systems; and nutrition; food safety; and quality. The programs are conducted in 46 of the 50 States, Puerto Rico, and the U.S. Virgin Islands. For ARS to maintain its standing as a premier scientific organization, major investments in computing, networking, and storage infrastructure are required. Training in data and information management are integral to the integrity, security, and accessibility of research findings, results, and outcomes within the ARS research enterprise. Nearly 2000 scientists and support staff conduct research within the ARS research enterprise.

Research Project: The SCINet/Big Data Fellows Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in working on agricultural-related problems at a range of spatial and temporal scales, from the genome to the continent, and sub-daily to evolutionary time scales. One of the goals of the SCINet Initiative is to develop and apply new technologies, including AI and machine learning, to help solve complex agricultural problems that also depend on collaboration across scientific disciplines and geographic locations. In addition, many of these technologies rely on the synthesis, integration, and analysis of large,

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diverse datasets that benefit from high performance computing clusters (HPC). The objective of this fellowship program is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each applicant and amenable to or required by the HPC environment. Training will be provided in specific AI, machine learning, deep learning, and statistical software needed for a fellow to use the HPC to search abd analyze large metagenomics datasets.

Under the guidance of a mentor, the participant will have the opportunity to gain experience developing a large-scale cloud compute and high performance computing system for indexing and searching petabyte-scale genomics and metagenomics datasets using locality sensitive hashing. There is also the opportunity to learn to develop statistical models for normalizing the sensitivity and recall of search by locality-sensitive hashing.

Learning Objectives: The participant will learn HPC computing technologies and will help develop and co-lead ARS-wide workshops, resulting in a community of scientific practice in computational metagenomics.The participant will have the opportunity to collaborate with multiple USDA ARS scientists on metagenomics, microbiomes, real-time pathogen monitoring, and machine learning applications in agriculture.

Mentor(s): If you have questions about the nature of the research, please contact Dr. Adam Rivers (adam.rivers@usda.gov). Lab web site https://tinyecology.com

Anticipated Appointment Start Date: As soon as a qualified candidate is identified. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year, but may be renewed upon recommendation of ARS and is contingent on the availability of funds.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant(s) will receive a monthly stipend commensurate with educational level and experience.

Citizenship Requirements: This opportunity is available to U.S. citizens, Lawful Permanent Residents (LPR), and foreign nationals. Non-U.S. citizen applicants should refer to the Guidelines for Non-U.S. Citizens Details page of the program website for information about the valid immigration statuses that are acceptable for program participation.

ORISE Information: This program, administered by ORAU through its contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and ARS. Participants do not become employees of USDA, ARS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

Questions: Please visit our Program Website. After reading, if you have additional questions about the application process please email ORISE.ARS.SCINet@orau.org and include the reference code for this

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opportunity.

Qualifications

The qualified candidate should have received a doctoral degree in one of the relevant fields listed below.

Preferred skills:

- Proficiency in Linux and Bash scripting
- Experience in Python or other languages
- Experience with Github and workflow managers like Nextflow
- Some experience with statistical modeling
- An interest in biological applications

We recognize that everone has a unique mix of skills and welcome applications from anyone who has an established track record of productivity in metagenomics research.

Eligibility Requirements

- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (4 👁)
  - **Earth and Geosciences** (1 👁)
  - **Environmental and Marine Sciences** (5 👁)
  - **Life Health and Medical Sciences** (10 👁)
  - **Mathematics and Statistics** (1 👁)