Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in Taxon-specific Model Training to Improve Accuracy of Variant Calling in Non-model Systems
Opportunity Reference Code: USDA-ARS-SCINet-2023-0260

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SCINet-2023-0260

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. 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 5/24/2024 3:00:00 PM Eastern Time Zone

Description ***Applications are reviewed on a rolling basis.**

ARS Office/Lab and Location: A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), located in Hilo, Hawaii.

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 postdoctoral fellows conduct research within the ARS research enterprise.

Research Project: The SCINet/Big Data Research Participation Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in solving agriculture-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, diverse datasets that benefit from high performance

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computing (HPC) clusters. The objective of this fellowship is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each applicant and amenable to or requiring the HPC environment. Training will be provided in data science, scientific computing, AI/machine learning, and related topics as needed for the fellow to complete their research.

Throughout the course of this research project, the participant will have the opportunity to gain experience in and learn about genome variant calling in a wide range of taxa and develop methods for improving existing variant calling models for non-model species using 3rd generation sequencing technology and data from non-standard short-read sequencers. The participant will learn about the application of AI to genome variant detection and its applications to insect pest genomic trait mapping and marker assisted breeding.

Learning Objectives: The participant will learn about a wide range of activities related to plant and insect genome sequencing, developing genome variant training sets, training convolutional neural networks, object-oriented programming languages such as R and Python, and science communication activities in support of the BDI and the ARS AI Center of Excellence (AI COE). The participant will also have the opportunity to take on-line courses in scientific topics, such as R, Python and statistics, and to learn collaboration and leadership skills through workshop and collaborative group experience.

Mentor(s): The mentor(s) for this opportunity is Sheina Sim (sheina.sim@usda.gov). Please contact the mentor if you have questions about this opportunity.

Anticipated Appointment Start Date: 2024; start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for two years 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 will receive a monthly stipend commensurate with educational level and experience. **The current stipend range for this opportunity is $85,000 - $95,000/year plus a supplement to offset a health insurance premium.**

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

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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 opportunity.

Qualifications

The qualified candidate should have received a doctoral degree in one of the relevant fields or be currently pursuing the degree with completion before December 31, 2023 or prior to start of appointment. Degree must have been received within the past five years.

Preferred skills:

- Experience developing, testing, and refining machine learning models
- Experience developing HPC workflows
- Excellent written and oral communication skills.
- Experience in team and collaborative scientific environments.
- Proficiency in command-line interfaces

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (1)
  - **Engineering** (2)
  - **Life Health and Medical Sciences** (10)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).