Opportunity Title: USDA-ARS High Performance Computing Fellowship
Opportunity Reference Code: USDA-ARS-2022-0071

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2022-0071

How to Apply

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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 9/29/2023 3:00:00 PM Eastern Time Zone

Description

***Applications will be reviewed on a rolling-basis.**

ARS Office/Lab and Location: Multiple master's level research opportunities are currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) located in Beltsville, Maryland.

This research opportunity is part of the SCINet Fellowship program at ARS. All fellows will spend time at headquarters for some of their training, but will be based in Beltsville, Maryland for more specific training. The SCINet/Big Data Program at ARS offers research opportunities to motivated participants interested in solving agricultural- and natural resource-related problems at a range of spatial and temporal scales, from the genome to the continent, and sub-daily to evolutionary time scales, as well as metadata enhancement for data discovery for big data analyses. One of the goals of the SCINet Initiative is to develop and apply new technologies, including artificial intelligence (AI) and machine learning, and natural language processing 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, linkage, and analysis of large, diverse datasets that benefit from high performance computers (HPC). The objective of these opportunities is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each participant and amenable to or required by the HPC environment. Training will be provided in specific AI, machine learning, deep learning, natural language processing, and statistical software needed for the HPC.

Research Project: Some research activities have historically been conducted in local computing environments, constraining potential solutions in terms of computing capability and the size of the study area. With this fellowship, high performance

computing (HPC) or cloud computing may enhance scientific computing and data management capability for more robust research results and impact. The specific Fellow project will depend on the interests of the fellow and their assigned mentor, and may cover one or more of:

- Agro-ecosystem dynamics at large spatial extents cannot be easily predicted by simply extrapolating from local, on-farm estimates. Agricultural yield, snow melt, and nitrogen or sediment in rivers are some examples where on-farm estimates need to be expanded from regional to continental scales through the integration of large data streams at fine-scale temporal resolutions.
- Research areas also include large scale data analyses for human nutrition, food safety and quality, genetics and genomics, animal welfare, animal and crop diseases and more related to animal and crop production and protection.
- Data analyses and linkage via enhanced metadata for the semantic web using AI (Natural Language Processing (NLP) and machine learning, etc.), which are key components of the Agricultural Research AI enterprise and the National Agricultural Library

Learning Objectives: The selected participant will have the opportunity to learn a range of computational skills needed to conduct research analyses in the above areas in an HPC or cloud-based environment. Under the guidance of a mentor, the participant will learn how to develop and co-lead ARS-wide workshops to synthesize and integrate the selected project topic data, and will help organize the scientific community. The participant will also have the opportunity to collaborate with multiple USDA ARS scientists on data analysis projects, and to write collaborative scientific papers to present their research.

Mentor(s): The mentor for this opportunity is Jennifer Woodward-Greene (Jennifer.woodward@usda.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: As soon as qualified candidates are 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.

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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.Northeast@orau.org and include the reference code for this opportunity.

Qualifications

The qualified candidate should have received a master's degree in one of the relevant fields.

Preferred skills:

- Experience modeling of geo-spatial data and remote sensing data
- Experience working with large datasets and data mining approaches
- Proficiency in R and python
- Strong database skills
- Strong oral and written communication skills

Eligibility Requirements

- **Degree:** Master's 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 👁)