Opportunity Title: USDA-ARS SCINet Postdoctoral Fellowship in Applying AI to Agricultural Ecosystem Service Planning
Opportunity Reference Code: USDA-ARS-2022-0145

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2022-0145

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 2/28/2023 3:00:00 PM Eastern Time Zone

Description ***Applications will be reviewed on a rolling-basis and this posting could close before the deadline.**

ARS Office/Lab and Location: A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Pasture Systems and Watershed Management Research Unit, located in University Park, PA 16802.

Research Project: 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.

The SCINet/Big Data Research Participation Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in collaborating 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, diverse datasets that benefit from high performance computing clusters (HPC). 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 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 analyze large datasets.

Under the guidance of a mentor, the participant will gain experience in modeling the consequences of land use decisions and agricultural conservation practices on ecosystem services such as pollination, soil erosion, and water quality in the context of a changing climate. Training opportunities will be developed based on prior expertise in agricultural or quantitative fields. The participant will learn a range of computational skills needed to conduct complex analyses of climate, land use, and other geospatial data in a cloud- and high performance computing-based environments, including machine learning approaches, ecosystem services modeling, and multi-criterion optimization at field, landscape, and regional scale, and will apply these skills to questions of land use, climate resilience, and agricultural management relevant to ARS objectives and regional needs.

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 around ecosystem services modeling and optimization in agricultural landscapes. The participant will have the opportunity to collaborate with multiple USDA ARS and university scientists on projects relating to modeling of agricultural ecosystem services, and to author and collaborate on scientific papers describing workflows and products of these analyses.

USDA-ARS Contact: If you have questions about the nature of the research, please contact Sarah Goslee (sarah.goslee@usda.gov).

Anticipated Appointment Start Date: 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 the mentor and 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. 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 by the appointment start date in one of the relevant fields listed below.

Preferred skills:

- Experience with or interest in modeling geospatial data
- Experience with or interest in modeling ecosystem services
- Experience working or interest in with regional climate and land use data
- Experience with computational programming, particularly R or python
- Strong oral and written communication skills

Eligibility Requirements

- **Degree:** Doctoral Degree.
- **Academic Level(s):** Postdoctoral.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (1)
  - **Earth and Geosciences** (21)
  - **Environmental and Marine Sciences** (14)
  - **Life Health and Medical Sciences** (48)