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Opportunity Title: USDA-ARS Remote Sensing of Agro-ecosystems & High-performance Computing Fellowship
Opportunity Reference Code: USDA-ARS-2021-0007

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2021-0007

How to Apply 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.

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Application Deadline 9/30/2022 3:00:00 PM Eastern Time Zone

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

ARS Office/Lab and Location: Multiple postdoctoral research opportunities are available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Southeast Watershed Research Laboratory located in Tifton, Georgia.

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 working on 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. 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 computers (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 the HPC.

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Small unmanned aerial systems (sUAS), or drones, offer a new frontier for remotely sensed image capture and data collection. Data from drones help to fill critical gaps in time series imagery from satellite sensors and, at the same time, provide a level of spatial detail for a relatively low cost. For agricultural research, sUAS-borne sensors support a variety of efforts, such as the scaling of measurements from local to field scale, and pinpointing agricultural problems. However, to be most useful, sensor data should be comparable across locations over time, and the research limitations of the data in this respect are not clear.

Under the guidance of a mentor, the participant will have the opportunity to gain experience in and learn about the challenges of sUAS data, including issues related to collection, processing, and use, while learning a range of computational skills needed to conduct complex analyses of drone data in a cloud-based environment, including machine learning approaches to image classification.

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 on cloud-based drone data analysis and sharing. The participant will have the opportunity to collaborate with multiple USDA ARS scientists on sUAS focused projects, and to write collaborative scientific papers dealing with the use of sUAS data for local to regional agro-ecological analyses.

USDA-ARS Contact: If you have questions about the nature of the research please contact Debra Peters (deb.peters@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 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 USDA-ARS@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.

Preferred skills:

- Experience modeling spatial data

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- Experience with analysis of time series data
- Experience working with sUAS, including automated flight data collection
- Proficiency in Pix4D, Agisoft, Envi OneButton, SiteScan or other sUAS data processing package
- Strong computational skills
- Strong oral and written communication skills

Eligibility Requirements

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