

Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in Artificial Intelligence and Big Agricultural Data

Opportunity Reference Code: USDA-ARS-SCINet-2023-0236

Organization U.S. Department of Agriculture (USDA)

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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.

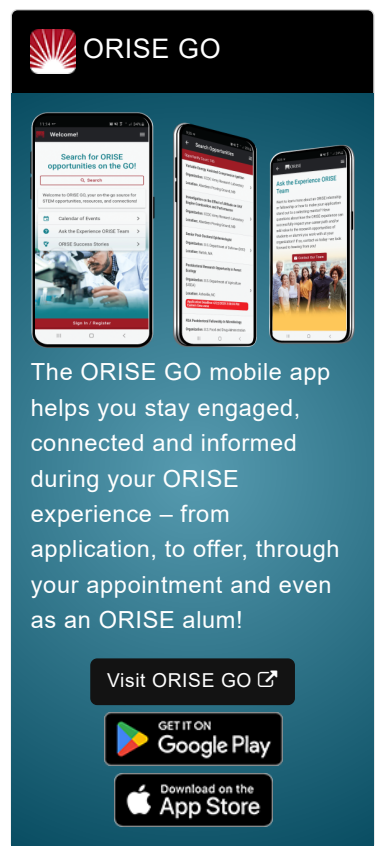
Application Deadline 3/1/2024 3:23:05 PM Eastern Time Zone

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

ARS Office/Lab and Location: A postdoctoral fellowship opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Hydrology and Remote Sensing Laboratory located in Beltsville, Maryland.


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 postdoctoral fellows 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 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


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technologies rely on the synthesis, integration, and analysis of large, diverse datasets that benefit from high performance 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.

Under the guidance of a USDA-ARS mentor and in collaboration with multi-institutional collaborators (e.g., the Ohio State University and University of Maryland), the participant will have opportunities to develop new explainable AI or interpretable ML methods with balanced predictive and explanatory power and apply the methods to isolate climate change effects from other confounding factors (e.g., improved varieties and management) on crop yields. The participant will also have opportunities to contribute to multi-disciplinary, multi-institution collaborative research projects investigating the sustainability of agricultural landscapes, and apply the explainable AI or interpretable ML methods to other interesting agricultural records, such as CO₂ and N₂O emissions, water quality indicators (e.g., carbon and nutrients) and large remote sensing datasets. The outcome from the project is anticipated to advance scientific knowledge to inform sustainable agricultural management under environmental change.

Learning Objectives: The participant will have access to trainings and resources from SCINet/AI-COE (e.g., technical tutorials and workshops) and receive training on cutting-edge explainable AI or interpretable ML methods. In addition, there will be opportunities for the participant to (1) interact with interdisciplinary research teams that include scientists, decision-makers, farmers and students, (2) write, publish, disseminate, and participate in or organize sessions in (inter)national conferences, and (3) create new computer modules and provide hands-on tutorials to empower SCINet's high-performance computing clusters with new AI capabilities. As a result, the participant is anticipated to improve technical, communication, teaching, and leadership skills to advance her/his professional career.

Mentor(s): If you have questions about the nature of the research, please contact Xuesong Zhang (xuesong.zhang@usda.gov), Glenn E. Moglen (glenn.moglen@usda.gov), or Kaiguang Zhao (zhao.1423@osu.edu).

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.

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 health insurance stipend and travel allowance.**

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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.

The successful applicant(s) will be required to comply with Environmental, Safety and Health (ES&H) requirements of the hosting facility, including but not limited to, COVID-19 requirements (e.g., facial covering, physical distancing, testing, vaccination).

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 start of appointment.

Preferred skills include:

- Experience with analysis of geospatial data and time series data
- Experience with machine learning and statistical learning
- Experience working with large, diverse datasets
- Familiarity with statistical modeling (ideally Bayesian statistics)
- Proficiency in R, Python, Matlab, or ideally other common languages (e.g., C/C++)
- Strong computational skills
- Strong oral and written communication skills

Eligibility • **Degree:** Doctoral Degree.

Requirements • **Discipline(s):**

- **Chemistry and Materials Sciences** ([2](#))
- **Computer, Information, and Data Sciences** ([10](#))
- **Earth and Geosciences** ([15](#))
- **Engineering** ([12](#))
- **Environmental and Marine Sciences** ([9](#))
- **Life Health and Medical Sciences** ([21](#))
- **Mathematics and Statistics** ([11](#))
- **Physics** ([5](#))

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