Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship to Improve Aerial Image-based Forest Fire Detection Using Deep Learning
Opportunity Reference Code: USDA-ARS-SCINet-2023-0261

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.
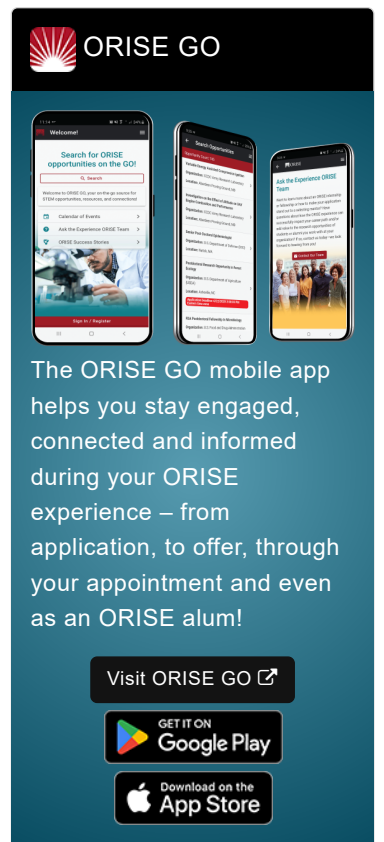
Application Deadline	12/31/2023 3:00:00 PM Eastern Time Zone
Description	*Applications are reviewed on a rolling basis.*

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 Fort Collins, Colorado.

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

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.

The project will involve two ARS WMSRU scientists, Huihui Zhang and Dave Barnard's labs, whose research uses landscape features, plot measurements, and remote sensing data to improve predictions of fuels treatment effectiveness and longevity in the Colorado Front Range. The participant will join the effort to develop deep learning methods for high-resolution aerial imagery for fuel treatment and forest structure monitoring, fuel load estimation, vegetation recovery assessment, post-treatment fire behavior, and post-treatment effectiveness. The participant will have the opportunity to gain experience in processing various types of aerial imagery and analyzing the data to derive insights regarding forest structure, vegetation dynamics, fuel characteristics, and improving fire risk prediction. The participant will have the opportunity to interact with local conservation agencies (e.g., Larimer Conservation District) and the Northern Colorado Fireshed Cooperative, an organization of federal, state, and local natural resource agencies and wildland fire operations that collaborate with scientists to develop cutting edge wildfire prevention and treatment approaches.

Learning Objectives: The fellow will receive hands-on training in multispectral and thermal image processing using professional remote sensing software, training and guidance in machine learning and data science provided by SCINet Learning pathway/Coursera workshops and the collaborators, and training and workshops on wildfire modeling and science offered by the US Forest Service Rocky Mountain Research Station in Fort Collins. The fellow will also have the opportunity to learn collaboration and leadership skills by co-leading a new collaborative research group or assisting in other SCINet collaborative research groups. There will also be opportunities to participate in field research to collect data used to test and validate deep learning models.

Mentor(s): The mentor(s) for this opportunity is Huihui Zhang (Huihui.zhang@usda.gov). Please contact the mentor if you have questions about this opportunity.

Anticipated Appointment Start Date: 2023; 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
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. Degree must have been received within the
past five years.

**Eligibility
Requirements**
- **Degree:** Doctoral Degree received within the last 60 months or
  anticipated to be received by 12/31/2023 12:00:00 AM.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (2 👁)
  - **Earth and Geosciences** (3 👁)
  - **Environmental and Marine Sciences** (5 👁)
  - **Life Health and Medical Sciences** (3 👁)
  - **Mathematics and Statistics** (1 👁)
- **Veteran Status:** Veterans Preference, degree received within the last
  120 month(s).