Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in AI/Machining Learning for Animal Behavior Research
Opportunity Reference Code: USDA-ARS-SCINet-2023-0202

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SCINet-2023-0202

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 9/8/2023 3:00:00 PM Eastern Time Zone

Description ***Applications are reviewed on a rolling basis.**

ARS Office/Lab and Location: A postdoctoral fellowship opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) located in Boise, Idaho. **This opportunity may be eligible to participate remotely.**

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 2,000 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.

Grazing land animals exhibit complex spatiotemporal behavioral responses to management, fire, and other broad-scale disturbance processes. These responses impact weaning weight, reproductive success, ecosystem health, and other metrics important to the rancher, pastoralist, and resource manager. Unfortunately, our ability to predict and assess animal responses to disturbance has been hampered by our limited capacity to extract meaningful information from typically huge, complex, and imperfect geospatial datasets. GPS tracking data are often used to monitor animal responses, but these data can contain large positioning error which adversely impact the efficacy of behavioral analyses. Additionally, the spatiotemporal aspect of these data is commonly under exploited by traditional approaches such as animal resource selection modeling. Novel, machine or deep learning approaches (e.g., gradient boosted machines or transformers) may allow us to effectively detect and remove positioning error in tracking data sets. Agent-based AI approaches (e.g., random forests, recurrent neural networks, or long short-term memory) may better exploit these tracking data providing more accurate predictions of animal responses to changes in management and environment than traditional approaches.

Learning Objectives: Under the guidance of a mentor, the participant in this Fellowship program will learn to apply AI approaches and technologies to animal tracking data from East Africa, Alaska, and various project locations distributed across the contiguous US. In so doing, the participant will directly contribute toward solutions to these important animal behavior research problems.

Mentor(s): The mentor(s) for this opportunity is Patrick Clark (pat.clark@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.**

Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in AI/Machining Learning for Animal Behavior Research
Opportunity Reference Code: USDA-ARS-SCINet-2023-0202

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. Degree must have been received within the past five years.

Preferred Skills:

- Experience modeling geospatial data
- Experience with analysis of time series data
- Experience working with large, diverse datasets and data mining approaches
- Proficiency in R or Python
- Strong computational skills
- Strong oral and written communication skills

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (4 👁)
  - **Earth and Geosciences** (1 👁)
  - **Environmental and Marine Sciences** (9 👁)
  - **Life Health and Medical Sciences** (13 👁)
  - **Mathematics and Statistics** (1 👁)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).

Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in AI/Machining Learning for Animal Behavior Research
Opportunity Reference Code: USDA-ARS-SCINet-2023-0202