

Opportunity Title: USDA-ARS Computer Vision & Artificial Intelligence Fellowship

Opportunity Reference Code: USDA-ARS-2022-0052

Organization U.S. Department of Agriculture (USDA)

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A complete application consists of:

- An application
- Transcripts – [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.

Description **Applications are reviewed on a rolling-basis, and this opportunity will remain open until filled.*

ARS Office/Lab and Location: A research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) Beltsville Agricultural Research Center (BARC), Sustainable Agricultural Systems Laboratory located in Beltsville, Maryland.

The US 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 recent AI Center of Excellence for the USDA ARS is recruiting candidates for opportunities in training and research related to a diverse array of AI technologies.

Research Project: This opportunity provides application deployment and DevOps support for a USDA-ARS led effort with University partners as part of the Precision Sustainable Agricultural team (national network of applied scientists, engineers, and data scientists), and numerous private partners. The participant will collaborate with a team of applied agricultural scientists, technologists, and data scientists to deploy models and applications into cloud computing environments. The research domains covered by this research include assessments



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of crop water stress, cover crop performance, and weed dynamics in agronomic cropping systems. Specific projects include developing high-throughput phenotyping systems for cover crop breeding, developing AI systems for direct measures of cash and cover crops (nutrients, biomass, yield), soils (sensor-based water content, EC, temperature measurements), remote sensing (satellites, drones), and proximal sensing (tractor-based LIDAR, radar, multispectral/hyperspectral cameras). The tools developed by our group use computer vision and machine learning approaches, and the participant should be comfortable reviewing and refactoring code to lift infrastructure from local development into production environments.

Learning Objectives: The participant will gain experience in

- Automation of deployment, testing, and continuous integration for internal and public-facing projects: dashboards, decision support tools, data repositories, APIs.
- Code review and systems architect consulting with internal researchers during their development of new tools.
- Security analysis and reporting on our cloud infrastructure.
- Develop and maintain documentation of applications and servers.
- Monitor IoT systems to detect anomalies and device failures.
- Refactor existing codebases to convert monoliths into containerized microservices.

Mentor(s): The mentor for this opportunity is Steven Mirsky (steven.mirsky@usda.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: As soon as a qualified candidate is identified. 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

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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 must have received a master's degree in one of the relevant fields before the start date of their appointment.

Preferred skills:

- Ability to develop, debug, and revise software code: Python, SQL, JavaScript, R, and Bash
- Configure and maintain Linux servers
- Familiarity with the standard offerings of commercial cloud providers (AWS, GCP, DigitalOcean, Azure). Knowledge of Azure-specific offerings
- Working knowledge of tools used in software application development such as git, REST API's, and relational databases
- Competence in server administration and basic cybersecurity of distributed systems
- Familiarity with Internet 2 and High-Performance Computing Clusters to move information to/from cloud or conduct intensive compute tasks outside commercial subscriptions

Eligibility Requirements

- **Degree:** Master's Degree.
- **Discipline(s):**
 - **Computer, Information, and Data Sciences** (5 )
 - **Earth and Geosciences** (1 )
 - **Engineering** (3 )
 - **Environmental and Marine Sciences** (5 )
 - **Life Health and Medical Sciences** (10 )
 - **Mathematics and Statistics** (1 )