Opportunity Title: USDA-ARS Computer Vision & Artificial Intelligence Fellowship
Opportunity Reference Code: USDA-ARS-2021-0157

Organization	U.S. Department of Agriculture (USDA)
Reference Code	USDA-ARS-2021-0157
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
- 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.

Application Deadline	9/30/2022 3:00:00 PM Eastern Time Zone
Description	***Applications are reviewed on a rolling-basis.***

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: Many applications of AI in agriculture center around the use of computer vision. Most of the "smart" implements envisioned for agriculture will require cameras that discern biotic and abiotic stressors. Agricultural scientists are now capable of training deep learning models for these applications. Once the domain of only well-trained experts, even the enigmatic world of deep learning is now easily accessible through libraries such as TensorFlow and PyTorch. This change has shifted the bottleneck for development to the availability of annotated image libraries. To train a convoluted neural network, thousands of carefully annotated images are required. These images must also be manipulated using synthetic image pipelines that amplify the original image dataset into the hundreds of thousands of images that are ultimately used for training.

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Learning Objectives: The selected participant will gain experience in data engineering needed to amplify the development and access to computer vision and AI for ARS scientists. The participant will: (1) collaborate with a national team of weed scientists to create a repository of imagery covering the major agricultural weed species in the U.S., (2) document the latest techniques for repository management and synthetic image creation, and (3) contribute to the level of knowledge about these methods across ARS to other disciplines.

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: 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 only.

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

Preferred skills:

- Good communication skills
- Experience with computer vision and learning, cloud data engineering, and Linux containers

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Master's Degree or Doctoral Degree.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (5 👁)
  - **Earth and Geosciences** (1 👁)

- **Engineering** (2 👁)
- **Environmental and Marine Sciences** (5 👁)
- **Life Health and Medical Sciences** (10 👁)
- **Mathematics and Statistics** (1 👁)