Opportunity Title: USDA-ARS Research Opportunity in Agricultural and Mechanical Engineering
Opportunity Reference Code: USDA-ARS-NEA-2026-0164

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-NEA-2026-0164

How to Apply ***To submit your application, scroll to the bottom of this opportunity and click APPLY.***

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.

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Application Deadline 6/5/2026 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), located in Beltsville, Maryland.

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific in-house research agency with a mission to find solutions to agricultural problems that affect Americans every day from field to table. ARS will deliver cutting-edge, scientific tools and innovative solutions for American farmers, producers, industry, and communities to support the nourishment and well-being of all people; sustain our nation's agroecosystems and natural resources; and ensure the economic competitiveness and excellence of our agriculture. The vision of the agency is to provide global leadership in agricultural discoveries through scientific excellence.

Research Project: The project examines how drones, robotic dogs, imaging systems, and AI based methods can be integrated to detect food safety risks such as animal intrusion and fecal contamination before harvest. During the appointment, you will participate in advanced research activities focused on autonomous multi agent technologies for preharvest safety inspection of produce fields. You will receive hands on experience in image acquisition, image analysis, AI model development, and data interpretation, with opportunities to collaborate on machine vision and autonomous system integration for field based agricultural applications. Project activities may also include research on communication and coordination between aerial and ground based platforms to support

automated field inspection with minimal user intervention. This educational opportunity is designed to complement doctoral level training and expand expertise in applied imaging, artificial intelligence, robotics, and agricultural safety technologies aligned with the USDA ARS mission.

Learning Objectives: By the end of this experience, the participant will be able to:

- Explain the principles of autonomous multi-agent systems and their application to preharvest food safety inspection in agricultural environments.
- Describe how drones, ground robots, imaging systems, and AI-based methods can be integrated to detect food safety hazards such as animal intrusion and fecal contamination in produce fields.
- Design and implement field-based image acquisition protocols using aerial and ground-based platforms for agricultural safety monitoring.
- Apply advanced image analysis and computer vision techniques to identify and classify food safety risks in agricultural settings.
- Develop and evaluate AI and machine learning models for automated detection of contamination and intrusion events.
- Interpret and validate imaging and sensor data to support evidence-based decision-making for preharvest safety interventions.
- Analyze communication and coordination strategies between aerial and ground robotic platforms to enable autonomous, low-intervention field inspection.
- Integrate machine vision, robotics, and AI components into a cohesive system for automated agricultural field inspection.
- Critically assess the performance, limitations, and scalability of autonomous inspection systems in real-world agricultural environments.
- Synthesize interdisciplinary knowledge in imaging, artificial intelligence, robotics, and agricultural safety to advance technologies aligned with the USDA ARS mission.

Mentor(s): The mentor for this opportunity is Insuck Baek (insuck.baek@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: June 1, 2026. 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: To be determined; negotiable.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience.

Citizenship Requirements: This opportunity is available to U.S. citizens only.

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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.Northeast@orau.org and include the reference code for this opportunity.

Qualifications

Applicants should be currently pursuing doctoral degree in agricultural engineering, mechanical engineering, computer science, robotics, imaging science, or a related field.

Preferred skills:

- Experience in AI, machine vision, image analysis, robotics, autonomous systems, and agricultural sensing.
- Experience with Python, machine learning or deep learning frameworks, and image based data processing is desirable.
- Familiarity with drones, robotic platforms, or integrated sensing systems for agricultural applications is also preferred.
- Strong communication and collaborative research skills are encouraged.

Point of Contact

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Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Currently pursuing a Doctoral Degree.
- **Discipline(s):**
  - **Engineering** (5 👁)