Opportunity Title: USDA-ARS Postdoctoral Fellowship in Optical Sensing and AI for Food Safety
Opportunity Reference Code: USDA-ARS-NEA-2026-0425

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-NEA-2026-0425

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 1/29/2027 3:00:00 PM Eastern Time Zone

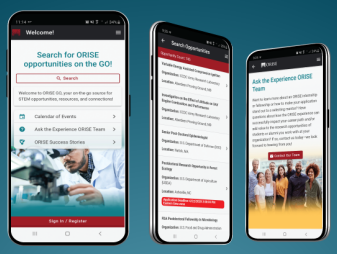
Description ***Applications are reviewed on a rolling-basis and applications may close before the deadline.**

ARS Office/Lab and Location: A postdoctoral research opportunity is currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Environmental Microbial and Food Safety Laboratory. The appointment may be based at either the Beltsville Agricultural Research Center (BARC) in Beltsville, Maryland, or the Eastern Regional Research Center (ERRC) in Wyndmoor, Pennsylvania.

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: This project focuses on developing optical sensing and artificial intelligence (AI) methods for food safety inspection. Research will integrate sensing with machine learning and deep learning to investigate relationships between optical measurements and food safety attributes. Applications include rapid identification of foodborne bacteria (e.g., *E. coli*, *Listeria*, and *Salmonella*) and detection of mycotoxin contamination in food and agricultural products (e.g., aflatoxin in corn).

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Under the guidance of USDA-ARS scientists, you may assist in experimental design and collecting and analyzing data using various imaging and spectroscopy techniques, such as reflectance, fluorescence, Raman, color, transmission, hyperspectral, and multispectral. Research activities may include helping in the development and improvement of sensing systems and control software, image and spectral processing, multimodal data fusion, and development of AI models for detection, classification, and prediction. You may collaborate with researchers in engineering, microbiology, and chemistry to help investigate sensing approaches for food safety applications. Participation may also assist in preparation of scientific manuscripts and conference presentations. These activities will provide hands-on research experience that complements your background.

Learning Objectives: Under the guidance of a mentor, you will:

- Learn and apply optical sensing techniques, including reflectance, fluorescence, Raman, color, transmission, hyperspectral, and multispectral, for identifying foodborne bacteria and detecting mycotoxin contamination in food and agricultural products.
- Gain hands-on experience in design, development, and experimental evaluation of optical sensing instruments and prototype systems for rapid food safety inspection.
- Develop skills in image and spectral processing, feature extraction, multimodal data fusion, and machine learning and deep learning, for food safety detection, classification, and prediction.
- Strengthen interdisciplinary collaboration and scientific communication skills through assisting in research discussions, preparation of manuscripts for peer-reviewed journals, and presentation of findings at scientific conferences.

Mentor(s): The mentor for this opportunity is Jianwei Qin (jianwei.qin@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

Anticipated Appointment Start Date: 2026/2027. 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.

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

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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 have received or be currently pursuing a doctoral degree in agricultural/biosystems engineering, mechanical engineering, electrical/computer engineering, computer science, food science, or a related field.

Preferred skills:

- Experience with imaging and spectroscopy, such as reflectance, fluorescence, Raman, color, transmission, hyperspectral, and multispectral.
- Experience with optical sensing instrumentation, laboratory automation, robotics, and LabVIEW programming for system control and integration.
- Experience applying machine learning, deep learning, and chemometrics to image and spectral data, including preprocessing, feature extraction, data fusion, and model evaluation.
- Proficiency in Python and MATLAB for scientific programming and data analysis.
- Familiarity with AI frameworks (e.g., PyTorch or TensorFlow) and models (e.g., YOLO and ViT) is desirable.
- Experience setting up computational environments and training and running AI models on GPU servers is also preferred.
- Familiarity with food safety research, particularly identification of foodborne bacteria and detection and analysis of mycotoxins.
- Strong experimental design, data analysis and interpretation, scientific writing, oral communication, and collaborative research skills.

Stipend

$80,000.00 – $110,000.00 Yearly

Point of Contact

Janeen

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (1 👁)
  - **Computer, Information, and Data Sciences** (6 👁)
  - **Engineering** (8 👁)
  - **Life Health and Medical Sciences** (1 👁)