University of Kentucky
Department of Biosystems and Agricultural Engineering

START TERM
Fall 2027

M.S. RESEARCH OPENING

Nanomaterials for Pesticide Sensing



Develop a rapid screening test for pesticide residues in agricultural samples.

M.S. project

- Design and characterize nanomaterials to learn how their properties affect the response to a target pesticide.
- Build a quantitative assay and measure its detection limit and repeatability.
- Use spiked agricultural samples to measure pesticide recovery and see which sample components interfere with detection.

Qualifications

EXPECTED
Hands-on wet chemistry lab experience.

PREFERRED
Experience with analytical chemistry or materials characterization.

How to apply

Email your CV and a brief note about your research interests.

Jian Shi
j.shi@uky.edu

University of Kentucky
Department of Biosystems and Agricultural Engineering

START TERM
Fall 2027

PH.D. RESEARCH OPENING

AI for Self-Driving Laboratories

Use AI and robotics to automate chemistry experiments, from planning and sample preparation to data collection.



AI experiment loop

Select → Run → Measure → Update

Ph.D. project

- Develop AI methods that use prior results and model uncertainty to select the next experiments.
- Integrate a robotic arm, automated pipetting, and analytical instruments so measurements feed back into the model.

Qualifications

EXPECTED

Foundational knowledge of chemistry and hands-on lab experience, such as preparing solutions, handling samples, or making analytical measurements.

PREFERRED

Experience with programming (such as Python), laboratory automation, or robotics.

How to apply

Email your CV and a brief note about your research interests.

Jian Shi
j.shi@uky.edu

Undergraduate Research Internships

Two openings · One intern per project



Nanomaterials for Pesticide Sensing

Design, prepare, and characterize nanomaterials for detecting pesticides.

WHAT YOU'LL NEED

Basic wet chemistry lab skills.



Robotics for a Self-Driving Lab

Work with a robotic arm and an automated pipetting robot. Assemble and tune lab instruments and configure robots for specific experimental tasks.

WHAT YOU'LL NEED

Comfort using Python scripts and AI coding tools like Codex. Students new to coding are welcome.

Apply by email

Barnhart Building, Lab 169

Kailong Zhang
k.zhang@uky.edu

Jian Shi
j.shi@uky.edu