

2025 AI IN AGRICULTURE AND NATURAL RESOURCES CONFERENCE

The 4th annual AI in Agriculture conference is being hosted by Mississippi State University (MSU) and its Agricultural Autonomy Institute. The conference will run from Monday, March 31, through Wednesday, April 2, 2025. The theme of this 4th annual conference is "the role of AI in autonomous agricultural systems and socioeconomic effects," but abstracts from all fields of AI in agriculture are welcome.

The conference will take place at The Mill (<https://www.devalumni.msstate.edu/mill-msu>), a historic agricultural building -- originally a cotton mill -- that is now home to MSU's Division of Development and Alumni. Join us as we seek to enhance the AI-in-agriculture research and technology community's knowledge of AI, share the work we are doing, and foster collaboration among U.S. university faculty, students, industry professionals, and stakeholders. Our goal is to improve food security and agricultural livelihoods through effective, efficient, and socio-economically mindful implementation of AI technology.

Location

The Mill, which is located at 600 Russell Street, Starkville, MS 39759
(immediately adjacent to Mississippi State University)

Dates & Times

March 31, 2025 – 9:00 am – 7:00 pm

April 1, 2025 – 8:30 am – 8:00 pm

April 2, 2025 – 8:00 am – 5:00 pm

Monday, March 31st

9:00-5:00 pm Registration The Mill Room

9:00-12:00 pm Pre-Conference Workshops or Tours (***must pre-register***)

- *Pre-conference Workshop 1 (9:00-9:50 am) in The Mill Ballroom*
Introduction to Cloud-Based Tools for Labeling and Training Object Detection Models
Dr. Ivan Grijalva and Dr. Thanos Gentimis; Louisiana State University

Machine learning models are valuable for detecting, classifying, and segmenting objects using imagery. As this technology advances, it helps automate labor-intensive agricultural tasks. YOLO models, for example, are effective in detecting both small and large objects, enabling automatic identification and counting, an essential task in agriculture and research. This beginner workshop will guide you in downloading imagery from open-source databases and provide hands-on experience in labeling images with tools like Roboflow or Labelbox. You will also learn to train and fine-tune object detection models for practical challenges in precision agriculture, such as detecting insects, weeds, and diseases using software. Additionally, we will examine current use cases, including the detection and identification of insects and other related agricultural problems.

Participants are expected to bring a laptop. The purpose is for participants to have some usable code when they leave the workshop.

- *Pre-conference Workshop 2 (10:00 am – 12:00 pm) in The Mill Ballroom*

SAS Workshop – Building an Ag-knowledgeable Chatbot

Ms. Shelly Hunt and Dr. John Gottula; SAS

Researchers and teachers often dismay at large language models' (LLMs) outrageous pontifications. In this workshop, you will learn how to arm a large language model with specific knowledge, such as from an agriculture or food research program. Participants' expected learning outcomes are to:

- 1) become familiar with natural language processing*
- 2) learn best practices for LLM augmentation*
- 3) understand how building a knowledgeable chatbot could apply to your research, teaching or extension program*

Participants are expected to bring a laptop for this hands-on workshop taught by SAS Institute agriculture data scientists.

9:00-12:00 pm Tours AAI, CAVS, Raspet

- ***Agricultural Autonomy Institute (AAI)*** is Mississippi State University's (MSU) newest University-level Institute focusing on the interdisciplinary integration of MSU's two most prominent areas of research and educational excellence –

agriculture and engineering (specifically autonomous vehicles). AAI is the nation's first and only academic institute exclusively dedicated to advancing Agricultural Autonomy.

- **Center for Advanced Vehicular Systems (CAVS)** is one of the premier university automotive research centers in the world in developing solutions to enhance transportation safety, improve vehicle efficiency, and increase the productivity of our workforce. CAVS strives to be a world-class center of excellence for research, technology and education equipped to address engineering challenges facing US mobility industries.
- **Raspjet Flight Research Laboratory (RFRL)** is a historic, nationally recognized leader in the field of experimental aviation research. Today, Raspjet continually advances modern concepts in experimental aviation through the research, development, testing, and evaluation of Unmanned Aircraft Systems (UAS) and their associated technologies.

12:30-2:00 pm	Lunch/Welcome	The Mill Room
	<ul style="list-style-type: none">• Dr. Mark Keenum, University President• Dr. David Shaw, University Provost and Executive Vice President• Dr. Julie Jordan, Mississippi State University, Vice President for Research and Economic Development• Dr. Keith Coble, Vice President, Division of Agriculture, Forestry and Veterinary Medicine (DAFVM)• Dr. Scott Willard, Director, MS Agricultural and Forestry Experiment Station (MAFES); Dean of the College of Agriculture and Life Sciences (CALS)• Dr. Angus Catchot, Director, MSU Extension Service• Dr. Robert Green, Interim Dean, Bagley College of Engineering	
2:00-3:00 pm	Keynote on AI in Agriculture	The Mill Room
	<ul style="list-style-type: none">• Dr. David Clifford, Founder of Artarmon AI, an independent AGTech consultancy	
3:00-3:30 pm	Coffee Break	The Mill Room
3:30-5:00 pm	CAST Paper Rollout and Panel	The Mill Room
5:00-7:00 pm	Poster Session (Social & Hors d'oeuvres)	The Mill Room

Tuesday, April 1st

7:30-8:30 am	Registration & Breakfast	The Mill Room
8:30-9:30 am	Keynote on AI for Autonomous Agricultural Systems <ul style="list-style-type: none">• <i>Dr. John Reid, Executive Director, Center for Digital Agriculture; University of Illinois Urbana-Champaign</i>	
9:30-9:50 am	Coffee Break	The Mill Room
9:50-11:30 am	5 Concurrent Breakout Sessions	The Mill Room
11:30 am-12:30 pm	Lunch	The Mill Room
12:30-1:45 pm	Industry Expert Panel <ul style="list-style-type: none">• <i>Dr. Ajay Sharda (Moderator), Kansas State University, Director of FarmsLab, Co-Director of Institute for Digital Agriculture and Advanced Analytics</i>	The Mill Room
1:45-2:00 pm	Coffee Break	The Mill Room
2:00-3:40 pm	Invited Speaker Sessions <ul style="list-style-type: none">• <i>Autonomy Session</i><ul style="list-style-type: none">○ <i>Dr. Ajay Sharda, Kansas State University</i>○ <i>Dr. Josh Peeples, Texas A&M University</i>○ <i>Dr. Christopher Hudson, Mississippi State University</i>○ <i>Dr. Marcus McGee, Mississippi State University</i>○ <i>Dr. Xin Zhang, Mississippi State University</i>• <i>Socioeconomic Issues</i><ul style="list-style-type: none">○ TBD	The Mill Room
3:45-5:30 pm	Grower Expert Panel <ul style="list-style-type: none">• <i>Dr. Craig Baillie (Moderator), Grains Research Development Council, Australia</i>	The Mill Room
6:00-8:00 pm	Dinner/Social	Davis Wade Stadium <i>Gridiron Club</i>

Wednesday, April 2nd

7:30-8:30 am	Breakfast	The Mill Room
8:30-9:45 am	Guest Speakers on Socioeconomic Issues of AI in Agriculture	The Mill Room
	<ul style="list-style-type: none">• <i>Dr. John Green, Director, Southern Rural Development Center</i><ul style="list-style-type: none">○ Rural Sociology• <i>Dr. Kollin Napier, Director, Mississippi Artificial Intelligence Network (MAIN)</i><ul style="list-style-type: none">○ Workforce Development• <i>Dr. Jonathan Barlow, Associate Director, Data Science Academic Institute</i><ul style="list-style-type: none">○ Higher Education	
9:45-10:00 am	Coffee Break	The Mill Room
10:00 am-12:00 pm	5 Concurrent Breakout Sessions	The Mill Room
12:00-2:00 pm	Lunch Poster Awards Closing Remarks	The Mill Room
2:00-5:00 pm	Multistate Project Meetings	The Mill Room
	<ul style="list-style-type: none">• <i>S1090 (AI in Agroecosystems: Big Data and Smart Technology-Driven Sustainable Production)</i>• <i>S1098 (Autonomy for Agricultural Production, Processing, and Research to Advance Food Security through Sustainable and Climate-Smart Methods)</i>	