



ASABE AIM – INDIANAPOLIS  
July 12-15, 2026

## TECHNICAL SESSION SCHEDULE

Listed below are all of the technical sessions and presentations scheduled at 2026 AIM, ordered by day and time.

**Poster Sessions** = Presenters will be at their printed poster in the common area ready to discuss their work individually or in small groups. A great opportunity to connect with the authors.

**Oral Sessions** = Standard 12-minute talk time with 2- to 3-minute question and answer period.

**Hybrid Sessions** = a mix of guest speaker and submitted abstract oral talks.

**Lightning Session** = 7-minute oral presentations and Q&A. A 7-minute discussion break after every fourth speaker is automatically scheduled to enable group discussion.

This document will be updated again to include presenters and times for each session.  
Updated on 3/23/2026-Subject to change.

Monday, July 13 - 9:30am-12:00pm

### ASE - Applied Science & Engineering

#### 101 Value Added Products from Bioprocessing

Monday, 9:30am - 12:00pm

**Technical Community:** ASE - Applied Science & Engineering

**Session Type:** Oral

**Description:** Value-added materials and biological or chemical processes for making value-added materials from biomass-derived feedstocks.

**Organizer:** Joe Sagues, wjsagues@ncsu.edu

**Sponsoring Committee:** ASE-16 Engineering for Sustainability; **Co-Sponsors:** ES-220 Bio-based Energy, Fuels and Products; PRS-707 Food & Organic Waste Management & Utilization

**Moderators:** Joe Sagues, Catherine Brewer

### CBSI - Circular Bioeconomy Systems Institute

#### 102 Advancing Circular Bioeconomy Systems (CBS): Opportunities and Challenges -HYBRID

Monday, 9:30am - 12:00pm

**Technical Community:** CBSI - Circular Biosecurity Systems Institute

**Session Type:** Hybrid

**Description:** This session will identify and describe key opportunities and challenges in circular bioeconomy systems (CBS) with an emphasis on research gaps, innovation pathways, and technology development. Discussions will focus on advancing integrated, science-based solutions across technical, environmental, financial, and infrastructure challenges to enable scalable and resilient CBS implementation.

**Organizer:** Mary Leigh Wolfe, mlwolfe@vt.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Erin Webb

### EOPD - Education, Outreach & Professional Development

#### 103 Innovations in Agricultural Education: AI, IoT, and Data-Driven Farming Skills

Monday, 9:30am - 12:00pm

**Technical Community:** EOPD - Education, Outreach & Professional Development

**Session Type:** Oral

**Description:** Bringing together diverse perspectives, this session explores themes related to innovations in agricultural education bridging tech and practice and smart farming education from data to decisions for empowering agricultural futures ai, iot, and lifelong learning. Case studies and research insights will illustrate both opportunities and constraints. Attendees will gain a deeper understanding of how these concepts shape professional practice.

**Organizer:** Jaime Thissen, jaimethissen1@gmail.com

**Sponsoring Committee:** EOPD-203 Undergraduate & Graduate Instruction; **Co-Sponsors:** EOPD-205 Engineering Technology & Management Education

**Moderators:** Dana Porter

## ES - Energy Systems

### 104 Energy Systems POSTER SESSION

Monday, 9:30am - 12:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Poster

**Description:** Energy Systems poster session.

**Organizer:** Hassan Jalalabadi, hkj0008@auburn.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

**Moderators:** Hossein Jahromi

### 105 Feedstock Engineering for Sustainable Bioenergy

Monday, 9:30am - 12:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research on municipal solid waste, biomass feedstock preprocessing, thermochemical conversion, and material handling

**Organizer:** Mi Li, mli47@utk.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

**Moderators:** Mi Li

### 106 Innovations in Anaerobic Digestion: Feedstock to Fuel

Monday, 9:30am - 12:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research anaerobic digestion, biogas, methane production, and waste valorization

**Organizer:** Saravanan Shanmugam, srs0065@auburn.edu

**Sponsoring Committee:** ES-210 Renewable Power Generation; **Co-Sponsors:**

**Moderators:** Saravanan Shanmugam

## ESH - Ergonomics, Safety & Health

### 107 Navigating Safety in Autonomous Agriculture: Risk & Regulation-HYBRID

Monday, 9:30am - 12:00pm

**Technical Community:** ESH - Ergonomics, Safety & Health

**Session Type:** Hybrid

**Description:** This program explores the evolving landscape of autonomous agriculture through research on risk assessment, safety standards, and regulatory pathways. Presenters examine layered safety approaches, global standardization efforts, and technology trends shaping ground-based autonomous vehicles. The session highlights

producer experiences, industry perspectives, and community views on human-robot interaction, alongside comparative analyses of regulatory models such as California's framework and ISO 18497. Together, these studies offer a grounded look at how risk, adoption, and policy intersect in the transition toward safer autonomous agricultural systems.

**Organizer:** Salah Issa, salah01@illinois.edu

**Sponsoring Committee:** ESH-04 Technology Exchange; **Co-Sponsors:**

**Moderators:** Salah Issa, Farzaneh Khorsandi

## ITSC - Information Technology, Sensors & Control Systems

### 108 3D Plant Geometry and Trait Extraction: Next-Gen Agricultural Insights

Monday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** 3D plant phenotyping

**Organizer:** Dongyi Wang, dongyiw@uark.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Dongyi Wang

### 109 AI-Powered Remote Sensing for Precision Crop Disease Management

Monday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on AI-powered remote sensing approaches for accurate plant disease detection, monitoring, and data-driven precision agriculture.

**Organizer:** Lirong Xiang, lxiang@cornell.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Lirong Xiang

### 110 Data-Driven Agriculture: From High-Throughput Phenotyping to Yield Forecasting- LIGHTNING SESSION

Monday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Lightning

**Description:** AI-driven, multi-modal phenotyping and sensing methods for crop yield prediction to support precision agriculture

**Organizer:** Hsiao-Mei Wu, hsmwu@ntu.edu.tw

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Shih-Fang Chen

### 111 From Ideas to Commercialization-PANEL SESSION

Monday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Panel

**Description:** This panel will explore the journey of transforming innovative research ideas into commercially viable technologies in agricultural and biological engineering.

**Organizer:** Evangelyn Alocilja, alocilja@msu.edu

**Sponsoring Committee:** ITSC-230 Biosensors; **Co-Sponsors:**

**Moderators:** Evangelyn Alocilja

## 112 Robotics for Precision Agriculture and Renewable Energy Automation

Monday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session explores emerging innovations in robotics and automation that are transforming both precision agriculture and renewable energy systems.

**Organizer:** Congliang Zhou, congliangzhou@agcenter.lsu.edu

**Sponsoring Committee:** ITSC-318 Mechatronics & Robotics; **Co-Sponsors:**

**Moderators:** Congliang Zhou, Wenhao Liu

## MS - Machinery Systems

### 113 Advances in Cotton Engineering

Monday, 9:30am - 12:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** The Advances in Cotton Engineering Session invites presentations focused on engineering research advancing cotton production, processing, and ginning.

**Organizer:** Sean Donohoe, sean.donohoe@usda.gov

**Sponsoring Committee:** MS-23/7/3 Cotton Engineering; **Co-Sponsors:**

**Moderators:** Sean Donohoe, Janie Moore

### 114 Efficiency in Agricultural Work and Machinery

Monday, 9:30am - 12:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** The session focuses on achieving sustainable efficiency in the areas of people, soil, and the environment.

**Organizer:** Heinz Bernhardt, heinz.bernhardt@tum.de

**Sponsoring Committee:** MS-45 Soil-Plant-Machine Dynamics; **Co-Sponsors:**

**Moderators:** Heinz Bernhardt

### 115 Machinery Systems POSTER SESSION

Monday, 9:30am - 12:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Poster

**Description:** MS poster session.

**Organizer:** Hao Gan, hgan1@utk.edu

**Sponsoring Committee:** **Co-Sponsors:**

## NRES - Natural Resources & Environmental Systems

### 116 Innovations in Agricultural Nutrient and Water Management

Monday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This session brings together researchers working at the intersection of science, engineering, and practice. Presentations address irrigation, water conservation, nutrient management within the context of real-world environmental and resource constraints. Emphasis is placed on translational impact, measurable outcomes, and implementation pathways.

**Organizer:** Rabin Bhattarai, rbhatta2@illinois.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:** NRES-224 Water Quality; NRES-223 Erosion Control Research

**Moderators:** Laxmi Prasad

### 117 Remote Estimation of Evapotranspiration in Natural and Agricultural Systems-HYBRID

Monday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Hybrid

**Description:** This session focuses on applications and limitations of remote sensing data, data fusion and other modeling approaches for estimating crop and forest evapotranspiration and its components and their prediction uncertainties.

**Organizer:** Devendra Amatya, devendra.m.amatya@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:**

**Moderators:** Devendra Amatya, Sudhanshu Panda

### 118 Sustainable Treatment of Contaminated Stormwater and Agricultural Wastewaters

Monday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Recent advances in monitoring, analytics, and system optimization are featured in this session. Authors present work related to wastewater treatment, constructed wetlands, phytoremediation, demonstrating how technical insights translate into field performance. Participants will gain perspective on integration across scales, from local implementation to watershed or regional impacts.

**Organizer:** Jason Oliver, jpo53@cornell.edu

**Sponsoring Committee:** NRES-25 Streams, Reservoirs, and Wetlands Group; **Co-Sponsors:**

**Moderators:** Jason Oliver

### 119 Artificial Intelligence and Precision Phenotyping and Detection

Monday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Focused on advancing knowledge in natural resource systems, this session highlights emerging technical approaches. Topics include phenomics, disease detection, artificial intelligence and associated analytical or field-based methodologies. Speakers will discuss lessons learned, scalability, and opportunities for interdisciplinary collaboration.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Johnny Grace, Satyanarayan Dev

## PAFS - Plant, Animal & Facility Systems

### 120 Engineering Solutions for Sustainable Livestock Production Systems

Monday, 9:30am - 12:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** This technical session explores diverse approaches to improving efficiency and sustainability of livestock and poultry production systems.

**Organizer:** Craig Smallegan, cpsmallegan@gmail.com

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-407 Animal Welfare; PAFS-07/1 Agri-Industrial Facility Design and Operation

**Moderators:** Craig Smallegan, Gregory Williams

### 121 Livestock Identification, Location, and Tracking

Monday, 9:30am - 12:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** Novel approaches for identifying, tracking, and behavior monitoring in livestock and poultry applications will be presented.

**Organizer:** Josh Sander, joshua.sander@gmail.com

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-407 Animal Welfare

**Moderators:** Josh Sander, Nesli Onuki

## PRS - Processing Systems

### 122 Upcycling & Bio-based Materials: From Waste to Value-LIGHTNING SESSION

Monday, 9:30am - 12:00pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Lightning

**Description:** Organic waste is often considered as liability but with proper processing valuable materials, chemicals, and products can be recovered from waste that can improve circularity. This session will focus on bioprocessing, fermentation, and other processes of organic waste into value-added products.

**Organizer:** Toufiq Reza, treza@fit.edu

**Sponsoring Committee:** PRS-707 Food & Organic Waste Management & Utilization; **Co-Sponsors:**

**Moderators:** Toufiq Reza

## ASE - Applied Science & Engineering

### 123 National Agricultural Producers Data Cooperative: All Things Data Data Data -GUEST

#### SPEAKERS

Monday, 2:30pm - 5:00pm

**Technical Community:** ASE - Applied Science & Engineering

**Session Type:** Guest

**Description:** Invited speakers will address how agricultural data is acquired, protected, shared, and stored, covering topics ranging from machinery to applications and automation. Their presentations will provide foundational insights that may inform future state and federal policies.

**Organizer:** Jennifer Clarke, jclarke3@unl.edu

**Sponsoring Committee:** ASE-347 and US TAG for TC 347 Data-driven agrifood systems; **Co-Sponsors:**

**Moderators:** Jennifer Clarke, Nasima Subedi

## E-2050 - Global Engagement

### 124 AOCABFE Exchange Forum: Research and Technology Transfer -GUEST SPEAKERS

Monday, 2:30pm - 5:00pm

**Technical Community:** E-2050 - Global Engagement

**Session Type:** Guest

**Description:** This session recognizes the academic and research achievements of its members and assists ABE researchers through invited talks and Q/A sessions on research and collaborations, career development, technology transfer, and entrepreneurship.

**Organizer:** Ce Yang, ceyang@umn.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Ce Yang

## EOPD - Education, Outreach & Professional Development

### 125 Engineering Agricultural Education & Workforce Development for Next-Gen AgTech

Monday, 2:30pm - 5:00pm

**Technical Community:** EOPD - Education, Outreach & Professional Development

**Session Type:** Oral

**Description:** This session examines current developments in engineering the future of agriculture education & workforce development and bridging the gap skills for next-gen agtech for innovating agricultural systems from lab to field training, drawing attention to practical implementation and measurable outcomes. Speakers will share applied experiences from academic and industry settings that demonstrate impact. Participants will leave with actionable ideas that can be adapted within their own programs.

**Organizer:** Deepak Keshwani, deepak.keshwani@usu.edu

**Sponsoring Committee:** EOPD-205 Engineering Technology & Management Education; **Co-Sponsors:** EOPD-203 Undergraduate & Graduate Instruction

**Moderators:** Deepak Keshwani

## ES - Energy Systems

### 126 Agrivoltaics and Renewable Energy Pathways to Develop Resilient Energy Systems

Monday, 2:30pm - 5:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research on hydropower, solar, agrivoltaics, energy resilience, smart grids, rural energy, and distributed generation

**Organizer:** Jaya Tumuluru, JayaShankar.Tumuluru@usda.gov

**Sponsoring Committee:** ES-210 Renewable Power Generation; **Co-Sponsors:**

**Moderators:** Jaya Tumuluru

### 127 Sustainable Thermochemical and Biochemical Conversion of Biomass

Monday, 2:30pm - 5:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research on biorefineries, valorization of agricultural residues and waste using mixed conversion technologies, sustainable processing, and the circular economy

**Organizer:** Deepak Kumar, dkumar02@esf.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

**Moderators:** Deepak Kumar

## ESH - Ergonomics, Safety & Health

### 128 Designing for Stability: Simulation and Testing of Agricultural Vehicles

Monday, 2:30pm - 5:00pm

**Technical Community:** ESH - Ergonomics, Safety & Health

**Session Type:** Oral

**Description:** This program brings together research advancing the stability, rollover prevention, and structural protection of modern agricultural vehicles. Through simulation, tilt-table testing, performance-based protocols, and sensor-driven measurement, presenters examine how machine design, load characteristics, and terrain influence overturn risk across ATVs, tractors, and harvesters.

**Organizer:** Salah Issa, salah01@illinois.edu

**Sponsoring Committee:** ESH-04 Technology Exchange; **Co-Sponsors:**

**Moderators:** Farzaneh Khorsandi, Serap Gorucu

## ITSC - Information Technology, Sensors & Control Systems

### 129 AI-Powered Vision for Precision Agriculture: Enhancing Detection and Segmentation

Monday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** Advanced deep learning models for precision agriculture detection and segmentation

**Organizer:** Dongyi Wang, dongyiw@uark.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Dongyi Wang

### 130 Information Technology, Sensors and Control Systems POSTER SESSION

Monday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Poster

**Description:** This poster session presents research on sensing technologies, machine vision, artificial intelligence, robotics, and data-driven systems for agricultural and biological engineering. Topics include UAV and remote sensing, IoT and wireless sensor networks, hyperspectral and imaging technologies, autonomous systems, and digital tools for monitoring, analysis, and management of agricultural and environmental system

**Organizer:** Dana Choi, dana.choi@ufl.edu

**Sponsoring Committee:** ITSC-06 Programs; **Co-Sponsors:**

**Moderators:** Dana Choi

### 131 Smart Sensing: AI and Spectroscopic Technologies for Agricultural Product Quality

Monday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** Applying AI-related methods on spectroscopic data for non destructive agricultural product quality sensing

**Organizer:** Shih-Fang Chen, sfchen@ntu.edu.tw

**Sponsoring Committee:** ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**

**Moderators:** Haibo Yao, Sindhuja Sankaran

## MS - Machinery Systems

### 132 Edge AI for Precision Agriculture: Sensors to Decisions

Monday, 2:30pm - 5:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Hao Gan, hgan1@utk.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Shahriar Ahmed, Hao Gan

### 133 Integrated Robotic Systems for Selective Harvesting and Crop Interaction

Monday, 2:30pm - 5:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** This session highlights recent advances in robotic systems for selective harvesting and other crop management operations, with emphasis on vision-guided perception, integrated end-effector design, and intelligent manipulation and control. Presentations cover applications across tree fruit, cotton, nursery, and specialty crops, addressing challenges such as occlusion, multi-arm coordination, picking/grasping, and field deployment. These contributions showcase how AI, sensing, and robotics are enabling more efficient, precise, and autonomous crop production systems.

**Organizer:** Azlan Zahid, azlan.zahid@tamu.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Yibin Wang, Al Bashir

## NRES - Natural Resources & Environmental Systems

### 134 Agricultural Water and Nutrient Management

Monday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Attendees will explore innovative strategies designed to improve performance and resilience across environmental systems. Research contributions span irrigation, nutrient management, water quality, integrating experimental data, modeling, and applied technologies. The dialogue centers on practical solutions and future research directions.

**Organizer:** Rabin Bhattarai, rbhatta2@illinois.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Rabin Bhattarai, Laxmi Prasad

### **135 Artificial Intelligence and Machine Learning in Crop Growth and Yield Prediction**

Monday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Focused on advancing knowledge in natural resource systems, this session highlights emerging technical approaches. Topics include artificial intelligence, machine learning, remote sensing and associated analytical or field-based methodologies. Speakers will discuss lessons learned, scalability, and opportunities for interdisciplinary collaboration.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Clement Sohoulade

### **136 Green Stormwater Infrastructure and Water Resource Management in Nature-Based Solutions**

Monday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Focused on advancing knowledge in natural resource systems, this session highlights emerging technical approaches. Topics include green stormwater infrastructure, urban hydrology, water resource management and associated analytical or field-based methodologies. Speakers will discuss lessons learned, scalability, and opportunities for interdisciplinary collaboration.

**Organizer:** Whitney Pagan, wl59680@uga.edu

**Sponsoring Committee:** NRES-21 Hydrology Group; **Co-Sponsors:**

**Moderators:** Whitney Pagan, Kira Hansen

### **137 Innovations in Agricultural Drainage: Reducing Phosphorus Loss and Protecting Water Quality**

Monday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Attendees will explore innovative strategies designed to improve performance and resilience across environmental systems. Research contributions span phosphorus, drainage, water quality, integrating experimental data, modeling, and applied technologies. The dialogue centers on practical solutions and future research directions.

**Organizer:** Jason Oliver, jpo53@cornell.edu

**Sponsoring Committee:** NRES-23 Drainage Group; **Co-Sponsors:**

**Moderators:** Jason Oliver

### **138 Irrigation Management-HYBRID**

Monday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Hybrid

**Description:** This hybrid session focuses on advancements and challenges in irrigation management across diverse agricultural systems. Emphasis will be placed on integrating precision irrigation technologies, data-driven decision tools, and climate-responsive strategies to improve water use efficiency. Presentations will highlight real-world applications, including sensor-based irrigation scheduling, remote monitoring systems, and adaptive management under water scarcity conditions. The hybrid format facilitates global participation and knowledge

exchange among researchers, practitioners, and industry professionals. Attendees will gain practical insights into scalable irrigation solutions that enhance sustainability and resilience in agricultural water management.

**Organizer:** Vivek Sharma, vsharma1@ufl.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Vivek Sharma, Vasudha Sharma

### 139 Sensors, Food Safety and Controlled Environmental Agriculture

Monday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Attendees will explore innovative strategies designed to improve performance and resilience across environmental systems. Research contributions span sensors, imaging, ai, integrating experimental data, modeling, and applied technologies. The dialogue centers on practical solutions and future research directions.

**Organizer:** Devendra Amatya, devendra.m.amatya@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:**

**Moderators:** Devendra Amatya, Sudhanshu Panda

## PAFS - Plant, Animal & Facility Systems

### 140 Livestock Manure and Poultry Litter Characteristics and Management

Monday, 2:30pm - 5:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** Novel measurement and management techniques for livestock manure, poultry litter, and emissions will be presented, including processing via Black Soldier Fly larvae.

**Organizer:** Suzanne Leonard, smleonard7@gmail.com

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-07/1 Agri-Industrial Facility Design and Operation

**Moderators:** Felipe Picchi, Suzanne Leonard

### 141 Precision Livestock Monitoring, Management, and Prediction

Monday, 2:30pm - 5:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** This session presents research advances in sensing architectures, computer vision, wearable sensor analytics, multimodal data integration, and predictive modeling frameworks in precision livestock systems.

**Organizer:** Yijie Xiong, yijie.xiong@unl.edu

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-407 Animal Welfare

**Moderators:** Yijie Xiong, Trey Standiford

### 142 Precision Nutrient, Water, and Plant Management in Hydroponics

Monday, 2:30pm - 5:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** This session examines strategies to optimize water and nutrient use efficiency in support of a more sustainable controlled environment agriculture (CEA) industry

**Organizer:** Phillip Addo, philip.addo@mail.mcgill.ca

**Sponsoring Committee:** PAFS-30 Plant Systems Group; **Co-Sponsors:** PAFS-07/1 Agri-Industrial Facility Design and Operation

**Moderators:** Phillip Addo, Melanie Correll

## PRS - Processing Systems

### 143 Sustainable Biogas & Nutrient Management Strategies

Monday, 2:30pm - 5:00pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Oral

**Description:** Nutrient management via biochemical processes is vital for organic wastes. In this session, biochemical processes including fermentation are discussed for manure management both economically viable and environmentally sustainable practices.

**Organizer:** Toufiq Reza, treza@fit.edu

**Sponsoring Committee:** PRS-707 Food & Organic Waste Management & Utilization; **Co-Sponsors:**

**Moderators:** Toufiq Reza

## YPC - Young Professional Community

### 144 Industry Panel Discussion for Young Professionals

Monday, 2:30pm - 5:00pm

**Technical Community:** YPC - Young Professionals Community

**Session Type:** Panel

**Description:** Industry Panel Discussion: Perspectives, Needs, and Expectations for Young Professionals  
Join us for an engaging session with industry leaders as they share insights into what companies look for in early-career professionals. This panel will highlight the skills, experiences, and mindsets that set young engineers up for success, and provide guidance on how to prepare for evolving industry demands.

**Organizer:** Tuyi Olowoyeye, tuyi.olowoyeye@ag.tamu.edu

**Sponsoring Committee:** YPC; **Co-Sponsors:** ISB

**Moderators:** Tuyi Olowoyeye, Emily Byers

## ASE - Applied Science & Engineering

### 201 Innovations in Sensing and Modeling for Sustainable Agriculture

Tuesday, 9:30am - 12:00pm

**Technical Community:** ASE - Applied Science & Engineering

**Session Type:** Oral

**Description:** Use of advanced machine vision and sensors to improve evaluation and modeling of crop performance, climate conditions, and decision-making for materials processing.

**Organizer:** Catherine Brewer, cbrewer@nmsu.edu

**Sponsoring Committee:** ASE-01 Applied Science and Engineering Executive; **Co-Sponsors:** ITSC-312 Machine Vision; ITSC-217 Computational Methods, Simulations & Applications; ASE-12 Forest Engineering

**Moderators:** Catherine Brewer, Muhaiminul Islam

## CBSI - Circular Bioeconomy Systems Institute

### 202 Integrating Circularity, AI, and Systems Design for Sustainable Bioeconomies

Tuesday, 9:30am - 12:00pm

**Technical Community:** CBSI - Circular Biosecurity Systems Institute

**Session Type:** Oral

**Description:** This session integrates indigenous ethical frameworks and spatial optimization with cutting-edge AI modeling to advance the circular bioeconomy. Presenters will bridge the gap between primary data collection challenges and machine learning to provide a roadmap for sustainable food, energy, and waste systems.

**Organizer:** Anita Thompson, amthompson2@wisc.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Anurag Mandalika, Anita Thompson

## EOPD - Education, Outreach & Professional Development

### 203 The Faculty of the Future - Evolving Faculty Roles in the Higher Education Landscape-PANEL SESSION

Tuesday, 9:30am - 12:00pm

**Technical Community:** EOPD - Education, Outreach & Professional Development

**Session Type:** Panel

**Description:** Focused on innovation and engagement, this session addresses key challenges connected to the faculty of the future - evolving faculty roles in the higher education landscape. Presenters will highlight lessons learned, emerging tools, and collaborative models. The discussion will encourage critical reflection and forward-looking strategies.

**Organizer:** Jaime Thissen, jaimethissen1@gmail.com

**Sponsoring Committee:** EOPD-205 Engineering Technology & Management Education; **Co-Sponsors:** EOPD-203 Undergraduate & Graduate Instruction

**Moderators:** Jaime Thissen

## ES - Energy Systems

### 204 Optimizing Agricultural Material Processing: Quality, Yield, and Efficiency

Tuesday, 9:30am - 12:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research on physical processing of biomass and agricultural byproducts, harvesting and milling

**Organizer:** Ashish Manandhar, amanand@clemson.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

**Moderators:** Ashish Manandhar

## 205 Thermochemical Conversion of Biomass: Innovations in Hydrogen and Bio-products

Tuesday, 9:30am - 12:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research on thermochemical conversion of biomass, hydrogen production, bio-based chemicals, and waste valorization

**Organizer:** Hossein Jahromi, hzj0048@auburn.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:**

**Moderators:** Hossein Jahromi

## ESH - Ergonomics, Safety & Health

### 206 Heat and Environmental Exposures: Impacts on Worker Safety-HYBRID

Tuesday, 9:30am - 12:00pm

**Technical Community:** ESH - Ergonomics, Safety & Health

**Session Type:** Hybrid

**Description:** This session highlights current research on major safety and health challenges in agricultural workplaces. Presentations address issues such as heat stress, infectious disease exposure, and injury risks from machinery and grain handling. The session also explores emerging technologies, including wearable sensors, and computer vision, to monitor hazards and support prevention efforts.

**Organizer:** Serap Gorucu, serapgorucu@ufl.edu

**Sponsoring Committee:** ESH-04 Technology Exchange; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Aaron Yoder, Kevin Moore

## ITSC - Information Technology, Sensors & Control Systems

### 207 Advancing Agricultural Robotics: From Simulation to Field Deployment

Tuesday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on sim2real agricultural robotics using digital twins, VLA models, and robust perception and control.

**Organizer:** Xin Zhang, xin.zhang2@uga.edu

**Sponsoring Committee:** ITSC-318 Mechatronics & Robotics; **Co-Sponsors:**

**Moderators:** Xin Zhang

### 208 AI, IoT, and Digital Twins for Next-Generation Agricultural Systems

Tuesday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session showcases AI, IoT, and digital twin-based systems that enhance irrigation, livestock management, and environmental decision-making. Emphasis is placed on data-driven, climate-smart solutions for sustainable and intelligent agriculture.

**Organizer:** Ramesh Bist, rbbist@ncsu.edu

**Sponsoring Committee:** ITSC-254 Emerging Information Systems; **Co-Sponsors:**

Moderators: Ramesh Bist, Frank Bai

### 209 AI-Powered Precision Agriculture: Early Pest Detection and Monitoring

Tuesday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on AI-powered early pest detection and monitoring

**Organizer:** Shangpeng Sun, shangpeng.sun@mcgill.ca

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Shangpeng Sun,

### 210 Harnessing Machine Vision and AI-Powered Prediction for Plant Phenotyping

Tuesday, 9:30am - 12:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session explores the convergence of novel machine vision and latest AI-powered prediction models to advance plant phenotyping.

**Organizer:** Xu Wang, xuwang1@ufl.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Xu Wang, Ce Yang

## MS - Machinery Systems

### 211 Advancements in Drone-Based Agricultural Sensing and Application

Tuesday, 9:30am - 12:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Cengiz Koparan, ckoparan@uark.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Cengiz Koparan

### 212 Autonomous Robotic and Sensing Systems for Precision Farming Applications

Tuesday, 9:30am - 12:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** This session highlights the development and/or application of different sensing, robotic and autonomous systems for precision farming operations.

**Organizer:** Simerjeet Virk, svirk@auburn.edu

**Sponsoring Committee:** MS-54 Precision Agriculture; **Co-Sponsors:**

**Moderators:** Simerjeet Virk, Jacob Sizemore

### 213 Data Orchestration and Governance for Trust and Transparency in Agri-Food Data Systems

Tuesday, 9:30am - 12:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Ziwen Yu, ziwen.yu@ufl.edu

**Sponsoring Committee:** **Co-Sponsors:**

Moderators: Ziwen Yu

## NRES - Natural Resources & Environmental Systems

### 214 Engineering Resilience: Lessons from Failures and Innovations-LIGHTNING SESSION

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Lightning

**Description:** This collection of talks examines evolving tools and frameworks shaping natural resource engineering. Key themes include failure analysis, remote sensing, machine learning, supported by quantitative analysis and applied case studies. The session encourages critical discussion of design tradeoffs, uncertainty, and long-term sustainability.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Johnny Grace, Satyanarayan Dev

### 215 Failed Research: Challenges and Opportunities-HYBRID

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Hybrid

**Description:** Conference presentations often highlight success stories from fieldwork, laboratory experiments, or modeling studies, illustrating hypotheses and their successful outcomes. These stories are typically well-crafted and later published in the literature. While such successes can be inspiring, the failures behind them often go unrecognized and their stories remain untold. Yet, it is through these challenges and setbacks that meaningful progress is made. Success is frequently built on failure. While ASABE AIM sessions are generally designed to showcase success stories, this unique HYBRID session will provide a platform to explore the less-visible foundations of those achievements. It will highlight the challenges faced with failed research efforts and how they ultimately led to successful outcomes and future opportunities. The session will feature examples from laboratory, field, and modeling investigations across various areas of natural resources and environmental systems. We also envision developing a collection of articles from this session to further share these important but often overlooked narratives with the broader community.

**Organizer:** Debabrata Sahoo, dsahoo@clemsun.edu

**Sponsoring Committee:** NRES-224 Water Quality; **Co-Sponsors:**

**Moderators:** Debabrata Sahoo, Ani Jayakaran

### 216 Hydrological Modeling, Crop Yield and Climate Change

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This collection of talks examines evolving tools and frameworks shaping natural resource engineering. Key themes include soil moisture, evapotranspiration, crop yield, supported by quantitative analysis and applied case studies. The session encourages critical discussion of design tradeoffs, uncertainty, and long-term sustainability.

**Organizer:** Sushant Mehan, sushantmehan@gmail.com

**Sponsoring Committee:** NRES-21 Hydrology Group; **Co-Sponsors:**

**Moderators:** Subhasis Giri, Kayode Adebayo Blessing

## 217 Indiana Manure Perspectives-GUEST SPEAKERS

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Guest

**Description:**

**Organizer:** Lingying Zhao, zhao.119@osu.edu

**Sponsoring Committee:** NRES-27 Ag By-products & Animal Mortality Management Systems; **Co-**

**Sponsors:**

**Moderators:** Lingying Zhao, Teng Lim

## 218 Modeling Runoff, Sediment, and Nutrient Transport

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Attendees will explore innovative strategies designed to improve performance and resilience across environmental systems. Research contributions span soil erosion, water quality, watershed modeling, integrating experimental data, modeling, and applied technologies. The dialogue centers on practical solutions and future research directions.

**Organizer:** Rabin Bhattarai, rbhatta2@illinois.edu

**Sponsoring Committee:** NRES-223 Erosion Control Research; **Co-Sponsors:** NRES-224 Water Quality; NRES-223 Erosion Control Research

**Moderators:** Jonathan Czuba

## 219 Natural Resources and Environmental Systems POSTER SESSION A

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Poster

**Description:** NRES poster session.

**Organizer:** Jaime Thissen, jaimethissen1@gmail.com

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources; NRES-224 Water Quality; NRES-24 Irrigation Group

**Moderators:** Jaime Thissen, Rabin Bhattarai

## 220 Water Use Efficiency and Agricultural Engineering in Precision Irrigation

Tuesday, 9:30am - 12:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Recent advances in monitoring, analytics, and system optimization are featured in this session. Authors present work related to precision irrigation, nitrogen management, water use efficiency, demonstrating how technical insights translate into field performance. Participants will gain perspective on integration across scales, from local implementation to watershed or regional impacts.

**Organizer:** Vivek Sharma, vsharma1@ufl.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Vivek Sharma, Vasudha Sharma

## PAFS - Plant, Animal & Facility Systems

### 221 Plant, Animal and Facility Systems POSTER SESSION

Tuesday, 9:30am - 12:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Poster

**Description:** All posters for the Plant, Animal and Facility Systems Community

**Organizer:** Suzanne Leonard, smleonard7@gmail.com

**Sponsoring Committee:** PAFS-06 Program; **Co-Sponsors:** PAFS-20 Structures Group; PAFS-30 Plant Systems Group; PAFS-40 Facilities & Systems Group; PAFS-50 Environmental Air Quality

**Moderators:** Suzanne Leonard

## PRS - Processing Systems

### 222 Biomass to Bioplastics: Materials, Processing, and Performance

Tuesday, 9:30am - 12:00pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Oral

**Description:** This session explores the conversion of diverse biomass and waste streams, including dairy byproducts, food waste, and lignocellulosic residues, into biodegradable plastics such as PHA, PHB, and PLA through advanced biological and process engineering approaches. Presentations highlight innovations in production pathways, techno-economic performance, and end-of-life biodegradation, emphasizing sustainable materials development and circular bioeconomy solutions.

**Organizer:** Clairmont Clementson,

**Sponsoring Committee: Co-Sponsors:**

**Moderators:**

### 223 Microbial Engineering for Bioreactor Performance

Tuesday, 9:30am - 12:00pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Oral

**Description:** This session explores microbial engineering strategies to enhance bioreactor performance across environmental and bioprocessing systems, including biofilters, aquaculture, and biomass conversion platforms. Presentations integrate metagenomics, process modeling, and advanced monitoring to optimize microbial activity, improve resource efficiency, and support sustainable biomanufacturing and environmental applications.

**Organizer:** Ming Hsun Cheng,

**Sponsoring Committee: Co-Sponsors:**

**Moderators:**

## E-2050 - Global Engagement

### 224 Foster Collaboration on Current Ag-Engineering Trends in Korea & the U.S.-HYBRID

Tuesday, 2:30pm - 5:00pm

**Technical Community:** E-2050 - Global Engagement

**Session Type:** Hybrid

**Description:** This session aims to explore current technological trends in agricultural and biological engineering while identifying career opportunities in both the U.S. and Korea. It is designed to foster collaboration between agricultural and biological engineers in the U.S. and Korea, as well as promote international partnerships between Korean and other countries.

**Organizer:** Anjin Chang, changanj@msu.edu

**Sponsoring Committee:** Co-Sponsors:

**Moderators:** Jaehak Jeong, Anjin Chang

## ES - Energy Systems

### 225 Biofuels, Bioproducts, and Bioservices

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** Research on biorefineries, valorization of agricultural residues and waste using mixed conversion technologies, sustainable processing, and the circular economy

**Organizer:** Lingling Liu, lingliu@uga.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:** ASE-16 Engineering for Sustainability

**Moderators:** Lingling Liu

### 226 Biomass Valorization: From Waste to High-Value Products

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Oral

**Description:** This session will entertain topics related to producing chemicals and materials from agricultural derived sources using both biochemical and thermochemical approaches. Additionally, this session will accept papers that discuss innovative ways to utilize biobased derived materials and chemicals.

**Organizer:** Stephen Chmely, sc411@psu.edu

**Sponsoring Committee:** ES-220 Bio-based Energy, Fuels and Products; **Co-Sponsors:** ASE-12 Forest Engineering

**Moderators:** Stephen Chmely

### 227 Current Achievements and New R&D Trends in Renewable Energy Resources and Tech-GUEST SPEAKERS

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ES - Energy Systems

**Session Type:** Guest

**Description:** New R&D Trends in Renewable Energy Resources and Technologies

**Organizer:** Jaime Thissen, jaimethissen1@gmail.com

**Sponsoring Committee:** ES-210 Renewable Power Generation; **Co-Sponsors:**

**Moderators:** Jaime Thissen

## ESH - Ergonomics, Safety & Health

### 228 Modernizing Agricultural Injury Prevention Through Analytics and Emerging Technologies

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ESH - Ergonomics, Safety & Health

**Session Type:** Oral

**Description:** Agriculture continues to face high rates of injuries and fatalities, many of which are underreported. New data sources, analytical methods, and training technologies offer opportunities to better identify hazards and prevent incidents. This session highlights advances in injury surveillance, machine learning–based risk analysis, and studies of equipment, electrical, and roadway hazards. It also explores innovative training approaches, including virtual reality and behavior-focused safety programs, to improve agricultural worker safety.

**Organizer:** Serap Gorucu, serapgorucu@ufl.edu

**Sponsoring Committee:** ESH-04 Technology Exchange; **Co-Sponsors:**

**Moderators:** Serap Gorucu, Salah Issa

## ITSC - Information Technology, Sensors & Control Systems

### 229 Applications of DEM and MBD in Agricultural Engineering

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on DEM and MBD simulations including soil–machine and granular material interactions for analysis and optimization of agricultural machinery performance.

**Organizer:** Douglas Cook, ddc971@byu.edu

**Sponsoring Committee:** ITSC-217 Computational Methods, Simulations & Applications; **Co-Sponsors:**

**Moderators:** Mohammad Sadek

### 230 From Signal to Accuracy: Next-Gen Sensing for Agricultural Diagnostics

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session explores innovative methods for extracting meaningful information from spectral data, with a strong emphasis on nitrogen estimation, yield prediction, and seasonal nutrient variability in crops.

**Organizer:** Momtanu Chakraborty, mchakraborty@ncat.edu

**Sponsoring Committee:** ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**

**Moderators:** Momtanu Chakraborty

### 231 Perception and Navigation in Ag Environments

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on 3D perception, spatial reasoning, and vision-based mapping and navigation for selective harvesting and autonomous operation in agricultural environments.

**Organizer:** Xin Zhang, xin.zhang2@uga.edu

**Sponsoring Committee:** ITSC-318 Mechatronics & Robotics; **Co-Sponsors:**

**Moderators:** Xin Zhang

### 232 Spectroscopic Sensing and Imaging for Quality Assessment in Agriculture and Food Systems

Tuesday, 2:30pm - 5:00pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** Development and applications of spectroscopic sensing and imaging technologies for agrifood uses.

**Organizer:** Micah Lewis, micah.lewis@usda.gov

**Sponsoring Committee:** ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**

**Moderators:** Mohammed Kamruzzaman, Micah Lewis

## MS - Machinery Systems

### 233 Advances in Robotic Sensing, Manipulation, and Autonomous Systems in Agriculture

Tuesday, 2:30pm - 5:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** This session focuses on advancing robotic systems, intelligent sensing, and autonomous navigation for agricultural production and processing environments.

**Organizer:** Cale Boriack, CALE.BORIACK@CNHIND.COM

**Sponsoring Committee:** MS-54 Precision Agriculture; **Co-Sponsors:**

**Moderators:** Cale Boriack

### 234 Perception for Precision Harvesting: From 3D Reconstruction to Pose Estimation

Tuesday, 2:30pm - 5:00pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Chuck Roth, rothchuck@johndeere.com

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:**

## NRES - Natural Resources & Environmental Systems

### 235 Advanced Imaging and Machine Learning for Precision Agriculture-LIGHTNING SESSION

Tuesday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Lightning

**Description:** This session brings together researchers working at the intersection of science, engineering, and practice. Presentations address plant phenotyping, machine learning, ai within the context of real-world environmental and resource constraints. Emphasis is placed on translational impact, measurable outcomes, and implementation pathways.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Anna Linhoss

### 236 Climate Mitigation and Crop Rotation in Cover Crops

Tuesday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Recent advances in monitoring, analytics, and system optimization are featured in this session. Authors present work related to cover crops, soil health, crop rotation, demonstrating how technical insights

translate into field performance. Participants will gain perspective on integration across scales, from local implementation to watershed or regional impacts.

**Organizer:** Sushant Mehan, sushantmehan@gmail.com

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:**

**Moderators:** Sudhanshu Sekhar Panda, Tuyi Olowoyeye

### **237 Hydrological Modeling and Sediment Transport in Stream Restoration**

Tuesday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Attendees will explore innovative strategies designed to improve performance and resilience across environmental systems. Research contributions span sediment transport, stream restoration, water quality, integrating experimental data, modeling, and applied technologies. The dialogue centers on practical solutions and future research directions.

**Organizer:** Sayantan Samanta, ssamanta@abe.msstate.edu

**Sponsoring Committee:** NRES-224 Water Quality; **Co-Sponsors:**

**Moderators:** Sayantan Samanta, Arun Bawa

### **238 Irrigation Scheduling and Precision Agriculture in Soil Moisture**

Tuesday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Attendees will explore innovative strategies designed to improve performance and resilience across environmental systems. Research contributions span machine learning, irrigation scheduling, soil moisture, integrating experimental data, modeling, and applied technologies. The dialogue centers on practical solutions and future research directions.

**Organizer:** Vivek Sharma, vsharma1@ufl.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Sandra Guzman

### **239 Natural Resources and Environmental Systems POSTER SESSION B**

Tuesday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Poster

**Description:** NRES poster session.

**Organizer:** Jaime Thissen, jaimethissen1@gmail.com

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources; NRES-224 Water Quality; NRES-24 Irrigation Group

**Moderators:**

### **240 Water Balance Models and Irrigation Scheduling in Evapotranspiration Management**

Tuesday, 2:30pm - 5:00pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This collection of talks examines evolving tools and frameworks shaping natural resource engineering. Key themes include evapotranspiration, irrigation scheduling, remote sensing, supported by quantitative analysis and applied case studies. The session encourages critical discussion of design tradeoffs, uncertainty, and long-term sustainability.

**Organizer:** Vivek Sharma, vsharma1@ufl.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**  
**Moderators:** Behmaz Molaei, Alok Pandit

## PAFS - Plant, Animal & Facility Systems

### 241 Computer Vision for Livestock: Behavior, Kinematics, and Health-LIGHTNING SESSION

Tuesday, 2:30pm - 5:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Lightning

**Description:** This session will feature research presentations on the application of computer vision to evaluate and quantify production performance, behavior, welfare, and health traits in livestock and poultry

**Organizer:** Yang Zhao, yzhao@utk.edu

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-407 Animal Welfare

**Moderators:** Yang Zhao, Lingying Zhao

### 242 Optimizing Controlled Indoor Plant Environments and Greenhouses

Tuesday, 2:30pm - 5:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** This technical session highlights innovations in environmental control, energy management, and lighting strategies that improve performance in indoor and greenhouse plant systems

**Organizer:** Jonathan Maisonneuve, maisonneuve@oakland.edu

**Sponsoring Committee:** PAFS-30 Plant Systems Group; **Co-Sponsors:** PAFS-07/1 Agri-Industrial Facility Design and Operation

**Moderators:** Jonathan Maisonneuve, Shamim Ahamed

### 243 Precision Livestock Ventilation Design, Control, and Validation

Tuesday, 2:30pm - 5:00pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** Precision techniques for livestock ventilation system management, evaluation, and design will be presented.

**Organizer:** Rick Stowell, rstowell2@unl.edu

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-407 Animal Welfare; PAFS-07/1 Agri-Industrial Facility Design and Operation

**Moderators:** Rick Stowell, Felipe Picchi

## PRS - Processing Systems

### 244 Advanced Imaging for Plant Stress Detection-LIGHTNING SESSION

Tuesday, 2:30pm - 5:00pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Lightning

**Description:** This session highlights advanced imaging and sensing technologies, including hyperspectral, thermal, and multimodal approaches, for early and accurate detection of plant stress across scales from leaf to canopy. Presentations emphasize integrating data-driven models, UAV and ground-based platforms, and sensor fusion

techniques to improve diagnosis of water, nutrient, and environmental stressors for precision agriculture applications.

**Organizer:**

**Sponsoring Committee: Co-Sponsors:**

**Moderators:**

## ASE - Applied Science & Engineering

### 301 Applied Sciences & Engineering POSTER SESSION

Wednesday, 7:30am - 10:00am

**Technical Community:** ASE - Applied Science & Engineering

**Session Type:** Poster

**Description:** Poster session for Applied Science & Engineering Technical Community

**Organizer:** Toufiq Reza, treza@fit.edu

**Sponsoring Committee:** ASE-01 Applied Science and Engineering Executive; **Co-Sponsors:**

**Moderators:** Toufiq Reza, Catherine Brewer

## EOPD - Education, Outreach & Professional Development

### 302 Education, Outreach & Professional Development POSTER SESSION

Wednesday, 7:30am - 10:00am

**Technical Community:** EOPD - Education, Outreach & Professional Development

**Session Type:** Poster

**Description:** This session examines current developments in EOPD poster session, drawing attention to practical implementation and measurable outcomes. Speakers will share applied experiences from academic and industry settings that demonstrate impact. Participants will leave with actionable ideas that can be adapted within their own programs.

**Organizer:** John Long, john.m.long@okstate.edu

**Sponsoring Committee:** EOPD-203 Undergraduate & Graduate Instruction; **Co-Sponsors:** EOPD-205 Engineering Technology & Management Education; EOPD-412 Professional Ethics

**Moderators:** John Long

### 303 Ethics of AI Tools and Large Language Models for Learning-PANEL SESSION

Wednesday, 7:30am - 10:00am

**Technical Community:** EOPD - Education, Outreach & Professional Development

**Session Type:** Panel

**Description:** This session highlights transformative approaches associated with ethics of ai tools and large language models for learning. Contributors will present evidence-based methods and innovative frameworks. Conversation will emphasize scalability, sustainability, and long-term professional growth.

**Organizer:** Deepak Keshwani, deepak.keshwani@usu.edu

**Sponsoring Committee:** EOPD-412 Professional Ethics; **Co-Sponsors:** E-03 Inclusion, Diversity, Equity and Access; EOPD-203 Undergraduate & Graduate Instruction

**Moderators:** Deepak Keshwani

## ESH - Ergonomics, Safety & Health

### 304 Ergonomics Safety & Health POSTER SESSION

Wednesday, 7:30am - 10:00am

**Technical Community:** ESH - Ergonomics, Safety & Health

**Session Type:** Poster

**Description:** ESH poster session.

**Organizer:** Salah Issa, salah01@illinois.edu

**Sponsoring Committee:** ESH-04 Technology Exchange; **Co-Sponsors:**

**Moderators:** Kevin Moore, Aaron Yoder

## ITSC - Information Technology, Sensors & Control Systems

### 305 Advanced Nanomaterials for Targeted Delivery in Agriculture-LIGHTNING SESSION

Wednesday, 7:30am - 10:00am

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Lightning

**Description:**

**Organizer:** Saad Sharief, shariefs@msu.edu

**Sponsoring Committee:** ITSC-230 Biosensors; **Co-Sponsors:**

**Moderators:** Saad Sharief,

### 306 Advanced Wireless Sensing for Precision Agriculture

Wednesday, 7:30am - 10:00am

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:**

**Organizer:** Hasan Seyyedhasani, seyyedhasani12@vt.edu

**Sponsoring Committee:** ITSC-254 Emerging Information Systems; **Co-Sponsors:**

**Moderators:**

### 307 AI, Machine Vision, and Intelligent Sensing for Agricultural Systems

Wednesday, 7:30am - 10:00am

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** Advances in artificial intelligence, machine vision, and sensing technologies are transforming agricultural production and monitoring systems. This session highlights recent developments in optical sensing, hyperspectral imaging, machine vision, and data-driven modeling for agricultural applications. The presented studies demonstrate how AI-enabled sensing and analytical tools can improve crop monitoring, phenotyping, grading, and decision-making in modern agricultural systems.

**Organizer:** Dana Choi, dana.choi@ufl.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Namrata Dutt

### 308 AI-Powered Robotics for Precision Agriculture

Wednesday, 7:30am - 10:00am

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:**

**Organizer:** Yuzhen Lu, luyuzhen@msu.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Yuzhen Lu

## MS - Machinery Systems

### 309 Advancements in Spray Technology and Application

Wednesday, 7:30am - 10:00am

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** This session includes advancements in many aspects of spraying equipment and methods for in-field, grove and lab spray systems using ground, drone or tower sprayers, including nozzle tips, spray tables, wind tunnels, canopy and row spacing, targeted spray, CFD and unit cleanliness measurement methods.

**Organizer:** Rex Ruppert, rex.ruppert@cnh.com

**Sponsoring Committee:** MS-23/6 Application Sys & US TAG ISO/TC23/SC6; **Co-Sponsors:** MS-54 Precision Agriculture; MS-60 Unmanned Aerial Systems

**Moderators:** Rex Ruppert,

### 310 Precision Seeding and Planting: Enhancing Efficiency and Yield

Wednesday, 7:30am - 10:00am

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Sami Khanal, khanal.3@osu.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Sami Khanal

### 311 Tractor Design: Conventional and Advanced Powertrains and Structures

Wednesday, 7:30am - 10:00am

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Edwin Brokesh, ebrokesh@ksu.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Ed Brokesh

## NRES - Natural Resources & Environmental Systems

### 312 Artificial Intelligence in Nutrient and Watershed Management and Modeling

Wednesday, 7:30am - 10:00am

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Recent advances in monitoring, analytics, and system optimization are featured in this session. Authors present work related to artificial intelligence, machine learning, water quality, demonstrating how technical insights translate into field performance. Participants will gain perspective on integration across scales, from local implementation to watershed or regional impacts.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-224 Water Quality; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Tushar Sinha, NaTasha Bell

### 313 Emerging Technologies in Agricultural Water Management

Wednesday, 7:30am - 10:00am

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This session explores emerging technologies and environmental drivers influencing agricultural water management and irrigation practices. Presentations examine how climate pressures such as extreme heat and water scarcity interact with advances in precision agriculture, robotics, and sensor-based systems to shape future irrigation strategies. Topics include robotic and automated irrigation platforms, spatial variability in soil and crop responses, water stress monitoring, and decision-support tools for improving water use efficiency. Together, these

studies highlight how integrated technological and environmental approaches can improve agricultural resilience, optimize irrigation performance, and support sustainable water resource management in modern farming systems.

**Organizer:** Jaime Thissen, jaimethissen1@gmail.com

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:** NRES-224 Water Quality

**Moderators:** Tobias Oker

### **314 Resilient Agricultural Water Management: Drainage, Reuse, and Recharge**

Wednesday, 7:30am - 10:00am

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This collection of talks examines evolving tools and frameworks shaping natural resource engineering. Key themes include drainage, water reuse, managed aquifer recharge, supported by quantitative analysis and applied case studies. The session encourages critical discussion of design tradeoffs, uncertainty, and long-term sustainability.

**Organizer:** Whitney Pagan, wl59680@uga.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Whitney Pagan

### **315 Precision Agriculture and Crop Monitoring in UAV Imaging**

Wednesday, 7:30am - 10:00am

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This session brings together researchers working at the intersection of science, engineering, and practice. Presentations address precision agriculture, remote sensing, uav imaging within the context of real-world environmental and resource constraints. Emphasis is placed on translational impact, measurable outcomes, and implementation pathways.

**Organizer:** Sayantan Samanta, ssamanta@abe.msstate.edu

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:**

**Moderators:** Sayantan Samanta, Arun Bawa

### **316 Remote Sensing in Water Quality Monitoring and Modeling Applications**

Wednesday, 7:30am - 10:00am

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Focused on advancing knowledge in natural resource systems, this session highlights emerging technical approaches. Topics include water quality, remote sensing, machine learning and associated analytical or field-based methodologies. Speakers will discuss lessons learned, scalability, and opportunities for interdisciplinary collaboration.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-224 Water Quality; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Niroj Aryal, Anish Jantrania

### **317 Water Use Efficiency and Groundwater Conservation in Irrigation Management**

Wednesday, 7:30am - 10:00am

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This session brings together researchers working at the intersection of science, engineering, and practice. Presentations address irrigation management, water use efficiency, climate change within the context of

real-world environmental and resource constraints. Emphasis is placed on translational impact, measurable outcomes, and implementation pathways.

**Organizer:** Vivek Sharma, vsharma1@ufl.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Sumona Datta, Bibek Acharya

## PAFS - Plant, Animal & Facility Systems

### 318 Innovations in Livestock Biosecurity and Health Monitoring

Wednesday, 7:30am - 10:00am

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Oral

**Description:** This session contains presentations related to disease and health monitoring and management for commercial livestock and poultry applications.

**Organizer:** Xufei Yang, yanglinyongyang@gmail.com

**Sponsoring Committee:** PAFS-40 Facilities & Systems Group; **Co-Sponsors:** PAFS-402 Beef Facilities; PAFS-403 Milk and Dairy Facilities; PAFS-404 Swine Facilities; PAFS-405 Poultry Facilities; PAFS-407 Animal Welfare

**Moderators:** Xufei Yang, Lingjuan Wang-Li

## PRS - Processing Systems

### 319 Advanced Food Processing: From Ingredients to 3D Structures

Wednesday, 7:30am - 10:00am

**Technical Community:** PRS - Processing Systems

**Session Type:** Oral

**Description:** This session explores advanced food processing technologies that transform diverse ingredients, including underutilized crops and novel biomaterials, into structured and functional food products. Presentations highlight innovations in rheology, fermentation, extrusion, and 3D/bioprinting to optimize food quality, nutrition, and performance from ingredient design to complex edible architectures.

**Organizer:** Tyler Barzee,

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:**

### 320 Innovations in Sustainable Agri-Food Drying and Storage Technologies-LIGHTNING SESSION

Wednesday, 7:30am - 10:00am

**Technical Community:** PRS - Processing Systems

**Session Type:** Lightning

**Description:** This session highlights emerging drying and storage technologies for agri-food systems, including solar, microwave, biomass-powered, and hybrid approaches to improve product quality, safety, and energy efficiency. Presentations also explore modeling, digital twins, and pest and microbial control strategies to enhance preservation, reduce losses, and support sustainable post-harvest systems.

**Organizer:** Ma. Cristine Ignacio,

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:**

### 321 Valorization of Agricultural Waste: From Manure to Materials

Wednesday, 7:30am - 10:00am

**Technical Community:** PRS - Processing Systems

**Session Type:** Oral

**Description:** This session explores innovative pathways for transforming agricultural wastes, including manure and lignocellulosic residues, into value-added materials such as fertilizers, biochar, adsorbents, and functional carbon materials. Presentations emphasize integrated processes for nutrient recovery, environmental remediation, and material performance, supported by techno-economic, life cycle, and safety assessments to advance circular bioeconomy solutions.

**Organizer:**

**Sponsoring Committee: Co-Sponsors:**

**Moderators:**

## ASE - Applied Science & Engineering

### 322 Engineering Aquatic Ecosystem Health

Wednesday, 10:15am - 12:15pm

**Technical Community:** ASE - Applied Science & Engineering

**Session Type:** Oral

**Description:** Monitoring, evaluation, and decision-making for environments including aquatic ecosystems

**Organizer:** Lori Duncan, laduncan@utk.edu

**Sponsoring Committee:** ASE-16 Engineering for Sustainability; **Co-Sponsors:** NRES-25 Streams, Reservoirs, and Wetlands Group

**Moderators:** Emine Fidan, Lori Duncan

## CBSI - Circular Bioeconomy Systems Institute

### 323 Resource Recovery, Production, and Resilience in Circular Bioeconomies POSTER SESSION

Wednesday, 10:15am - 12:15pm

**Technical Community:** CBSI - Circular Biosecurity Systems Institute

**Session Type:** Poster

**Description:** This session explores the synergistic integration of waste valorization and innovative processing strategies to advance closed-loop agricultural and industrial systems. By bridging the gap between resource reclamation and production pathways, these presentations highlight opportunities for enhancing circularity and long-term environmental resilience.

**Organizer:** Alicia Modenbach, alicia.modenbach@uky.edu

**Sponsoring Committee; Co-Sponsors:**

**Moderators:** Alicia Modenbach

## EOPD - Education, Outreach & Professional Development

### 324 Human-Centered Design and Ethical Frameworks for Digital Agriculture

Wednesday, 10:15am - 12:15pm

**Technical Community:** EOPD - Education, Outreach & Professional Development

**Session Type:** Oral

**Description:** Focused on innovation and engagement, this session addresses key challenges connected to human-centered design in digital agriculture and ethical frameworks for sustainable agrivoltaic systems for AI and technology integration in engineering education. Presenters will highlight lessons learned, emerging tools, and collaborative models. The discussion will encourage critical reflection and forward-looking strategies.

**Organizer:** John Classen, classen@ncsu.edu

**Sponsoring Committee:** EOPD-412 Professional Ethics; **Co-Sponsors:** EOPD-203 Undergraduate & Graduate Instruction

**Moderators:** John Classen

## ITSC - Information Technology, Sensors & Control Systems

### 325 Advanced Sensing and AI Processing for Data-Driven Agriculture Decisions

Wednesday, 10:15am - 12:15pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on the development of data-driven, scalable systems to provide actionable insights in the field, orchard, and processing systems. These systems encode agricultural expertise at scale through

multi-modal sensing and AI/ML based processing. A key focus of these projects is to arrive at actionable intelligence to improve processes in complex real-world systems.

**Organizer:** Joe Dvorak, joe.dvorak@uky.edu

**Sponsoring Committee:** ITSC-312 Machine Vision; **Co-Sponsors:**

**Moderators:** Joe Dvorak

### 326 Advancing Agricultural Intelligence: Combining Vision, Language, and Simulation

Wednesday, 10:15am - 12:15pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:**

**Organizer:** Ziwen Yu, ziwen.yu@ufl.edu

**Sponsoring Committee:** ITSC-254 Emerging Information Systems; **Co-Sponsors:**

**Moderators:** Ziwen Yu

### 327 Data Analytics, AI, and Digital Technologies for Smart Agricultural Management

Wednesday, 10:15am - 12:15pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** Data-driven decision support and artificial intelligence are increasingly integrated into agricultural management systems. This session presents emerging approaches that leverage machine learning, large language models, data analytics, and digital technologies to improve agricultural decision-making, safety, and sustainability. The papers illustrate applications across crop production, livestock systems, and agricultural knowledge management.

**Organizer:** Dana Choi, dana.choi@ufl.edu

**Sponsoring Committee:** ITSC-254 Emerging Information Systems; **Co-Sponsors:**

**Moderators:** Uchechukwu Ilodibe

### 328 Imaging Spectroscopy and Multimodal AI Systems for Automated Crop Quality Evaluation

Wednesday, 10:15am - 12:15pm

**Technical Community:** ITSC - Information Technology, Sensors & Control Systems

**Session Type:** Oral

**Description:** This session focuses on imaging spectroscopy and multimodal AI systems for automated crop quality assessment and grading.

**Organizer:** Alireza Pourreza, apourreza@ucdavis.edu

**Sponsoring Committee:** ITSC-348 Electromagnetics & Spectroscopy; **Co-Sponsors:**

**Moderators:** Alireza Pourreza, Mohammadreza Narimani

## MS - Machinery Systems

### 329 Innovations in Harvested Crop Materials and Machines

Wednesday, 10:15am - 12:15pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Edwin Brokesh, ebrokesh@ksu.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Shaghayegh Janbazialamdari, Ed Brokesh

### 330 Intelligent Weeding Systems: Precision and Autonomy in Action

Wednesday, 10:15am - 12:15pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:** This session will explore different methods and technologies brought to bear on the problem of precision weed control. Our speakers will explore ground-based robotic arm, ground-based precision spraying, and UAS-borne approaches.

**Organizer:** Andres Ferreyra, andres.ferreyra@syngenta.com

**Sponsoring Committee:** MS-54 Precision Agriculture; **Co-Sponsors:**

**Moderators:** Andres Ferreyra

### 331 Precision Agriculture Data: From Raw Signals to Reliable Insights

Wednesday, 10:15am - 12:15pm

**Technical Community:** MS - Machinery Systems

**Session Type:** Oral

**Description:**

**Organizer:** Shirin Ghatrehsamani, spg5994@psu.edu

**Sponsoring Committee:** **Co-Sponsors:**

**Moderators:** Shirin Ghatrehsamani

## NRES - Natural Resources & Environmental Systems

### 332 Artificial Intelligence and Precision Agriculture in Nitrogen Management -LIGHTNING SESSION

Wednesday, 10:15am - 12:15pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Lightning

**Description:** This collection of talks examines evolving tools and frameworks shaping natural resource engineering. Key themes include precision agriculture, nitrogen management, sensor technology, supported by quantitative analysis and applied case studies. The session encourages critical discussion of design tradeoffs, uncertainty, and long-term sustainability.

**Organizer:** Jason Oliver, jpo53@cornell.edu

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:**

**Moderators:** Jason Oliver

### 333 Distribution Uniformity and Precision Agriculture in Canopy Temperature

Wednesday, 10:15am - 12:15pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Focused on advancing knowledge in natural resource systems, this session highlights emerging technical approaches. Topics include irrigation, water management, precision agriculture and associated analytical or field-based methodologies. Speakers will discuss lessons learned, scalability, and opportunities for interdisciplinary collaboration.

**Organizer:** Vivek Sharma, vsharma1@ufl.edu

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:** NRES-224 Water Quality; NRES-223 Erosion Control Research

**Moderators:** Uday Vaddevolu

### 334 Modeling Soil Erosion and Water Quality in Agricultural Watersheds

Wednesday, 10:15am - 12:15pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Recent advances in monitoring, analytics, and system optimization are featured in this session. Authors present work related to irrigation, water management, water conservation, demonstrating how technical insights translate into field performance. Participants will gain perspective on integration across scales, from local implementation to watershed or regional impacts.

**Organizer:** Sushant Mehan, sushantmehan@gmail.com

**Sponsoring Committee:** NRES-24 Irrigation Group; **Co-Sponsors:**

**Moderators:** Bijoychandra Singh, Kayode Adebayo Blessing

### 335 Recirculating Aquaculture Systems and Resource Management in Circular Economy

Wednesday, 10:15am - 12:15pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** Focused on advancing knowledge in natural resource systems, this session highlights emerging technical approaches. Topics include aquaculture, aquaponics, recirculating aquaculture systems and associated analytical or field-based methodologies. Speakers will discuss lessons learned, scalability, and opportunities for interdisciplinary collaboration.

**Organizer:** Whitney Pagan, wl59680@uga.edu

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:**

**Moderators:** Whitney Pagan

### 336 Soil Hydraulic Properties and Agricultural Resilience in Geophysical Methods

Wednesday, 10:15am - 12:15pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Oral

**Description:** This collection of talks examines evolving tools and frameworks shaping natural resource engineering. Key themes include soil hydraulic properties, geophysical methods, water management, supported by quantitative analysis and applied case studies. The session encourages critical discussion of design tradeoffs, uncertainty, and long-term sustainability.

**Organizer:** Jasmeet Lamba, lamba@auburn.edu

**Sponsoring Committee:** NRES-25 Streams, Reservoirs, and Wetlands Group; **Co-Sponsors:** NRES-224 Water Quality; NRES-223 Erosion Control Research

**Moderators:** Jasmeet Lamba, Bijoychandra S. Takhellambam

### 337 Soil Property Predictions using Imagery and Machine Learning-LIGHTNING SESSION

Wednesday, 10:15am - 12:15pm

**Technical Community:** NRES - Natural Resources & Environmental Systems

**Session Type:** Lightning

**Description:** This session brings together researchers working at the intersection of science, engineering, and practice. Presentations address soil science, spectroscopy, machine learning within the context of real-world environmental and resource constraints. Emphasis is placed on translational impact, measurable outcomes, and implementation pathways.

**Organizer:** Johnny Grace, johnny.m.grace@usda.gov

**Sponsoring Committee:** NRES-28 Ecological Engineering; **Co-Sponsors:** NRES-26 Sustainable Land Resources

**Moderators:** Eban Bean

## PAFS - Plant, Animal & Facility Systems

### 338 R.S. Gates Memorial Lecture Series-GUEST SPEAKERS

Wednesday, 10:15am - 12:15pm

**Technical Community:** PAFS - Plant, Animal & Facility Systems

**Session Type:** Guest

**Description:** Throughout his distinguished 40-year career as an agricultural engineer, Richard S. Gates, PhD, PE, ASABE Fellow, and recipient of the Henry Giese Structures and Environment Award, made an indelible impact. His pioneering work and innovative contributions significantly advanced plant and animal production systems engineering, leaving a lasting legacy within the PAFS community. Each year, the session invites distinguished members of the PAFS community to share insights, experiences, and contributions to the society that reflect the values of Dr. Gates championed.

**Organizer:** Hanwook Chung, hwchung@iastate.edu

**Sponsoring Committee:** PAFS-01 Executive; **Co-Sponsors:** PAFS-04 Paper Awards; PAFS-20 Structures Group; PAFS-30 Plant Systems Group; PAFS-40 Facilities & Systems Group; PAFS-50 Environmental Air Quality

**Moderators:** Hanwook Chung

## PRS - Processing Systems

### 339 Bio-Augmented Systems for Resource Recovery from Wastewater-LIGHTNING SESSION

Wednesday, 10:15am - 12:15pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Lightning

**Description:** This session focuses on bio-augmented wastewater treatment systems that integrate microbial, algal, and engineered approaches to enhance resource recovery, including nutrients, energy, and valuable byproducts. Presentations highlight innovations in biological process optimization, hybrid technologies, and system integration to improve treatment efficiency, sustainability, and circular reuse in agricultural and environmental applications.

**Organizer:**

**Sponsoring Committee: Co-Sponsors:**

**Moderators:**

### 340 Processing Systems POSTER SESSION

Wednesday, 10:15am - 12:15pm

**Technical Community:** PRS - Processing Systems

**Session Type:** Poster

**Description:** PRS poster session.

**Organizer:** Janie Moore, janie.moore@ag.tamu.edu

**Sponsoring Committee: Co-Sponsors:**

**Moderators:**

## Special

### 341 Panel Discussion on US Federal Funding Scenarios

Wednesday, 10:15am - 12:15pm

**Technical Community:** Special

**Session Type:** Panel

**Description:** All the post-docs, research faculty, and tenure-track faculty are encouraged to attend this panel discussion. Representatives from academia, industry, and funding agencies will serve as panelists. This forum will be helpful to all the post-docs, research Faculty, and tenure-track Faculty during the current federal funding scenarios.

**Organizer:** Kasiviswanathan Muthukumarappan, muthukum@sdstate.edu

**Sponsoring Committee:** EOPD-210 Department Heads; **Co-Sponsors:** NCAC16  
**Moderators:** Kasiviswanathan Muthukumarappan,