PURDUE UNIVERSITY | Institute for Digital and Advanced Agricultural Systems



Directors' Opening

At the beginning of a new semester, we can link this time of year with many exciting new things from research to outreach and education.

From the research side, the government recently launched The Genesis Mission, a flagship push to fuel AI-driven discovery, with the goal of literally doubling US science productivity. This creates new opportunities for integration of AI and translation into real-world applications, with a strong component for building more strategic public-private alliances. Zooming out, this broader direction will reward places already set up for interdisciplinary work, which is the major cornerstone of our Institute.

From the teaching side, our team is excited to bring back **AGR 59500 "Research Fundamentals in the Era of AI"** with the main goal of providing the foundations of research and data management while using agentic and generative AI to design, analyze, and communicate research in a responsible and professional manner. Please pass this information to new graduate students (highly encouraged to them) and to current ones to freshen up and modernize the utilization of our scientific methods.

From the outreach side, our team is getting ready to host the second annual Symposium of Digital Agriculture (SyDAg) and Hackathon Weekend, in coordination with our newly established IDAAS Graduate Student Association. The events are designed to bring together faculty, staff, students, researchers, growers, industry professionals, and technology leaders with the new theme for this year, "Growing with AI," highlighting the increasing role of AI in agricultural decision-making, production systems, and technology adoption. This year will present an expanded technology showcase, where industry partners will demonstrate emerging digital agriculture tools, including drones, robotics, and other innovative technologies. To register for these events, please visit https://www.sydag.org

Our team and Institute will be quite busy during this semester with many seminars and events, and we hope to see you all in one of our many engaging activities!

Wishing you the best,

Ignacio Ciampitti

Explore the latest from IDAAS—click here to stay connected!

IDAAS Seminars, Webinars, Events

IDAAS Fall 2026 Seminar Series

The IDAAS Fall 2026 Seminar Series brings together industry leaders, researchers, and technology innovators to explore emerging ideas and advancements in digital agriculture. This semester's lineup features speakers from organizations including FFAR, Solinftec, Cropin, STgenetics, Gradable Farmer Operations, USDA, and The Ohio State University.

Topics will span public-private partnerships and agricultural innovation, physical-world AI, sustainability data, agricultural research and economics, and more. Join us throughout the fall for engaging conversations and opportunities to connect with others working to advance data-driven agriculture.

Seminars will be held throughout the semester, with most taking place on Thursdays from 11:30 a.m.–12:30 p.m. See the full schedule and speaker lineup below.

View past seminars here.



Image: IDAAS Seminar Fall Seminar Line-up

Second Annual SyDAg 2026 - Growing with AI

The 2nd Symposium of Digital Agriculture (SyDAg) will be held on September 28, 2026, from 8:00 AM to 5:00 PM at the Beck Agricultural Center, bringing together researchers, educators, growers, students, startups, and industry professionals to explore how artificial intelligence and digital technologies are reshaping agriculture.

This year's symposium will kick off with remarks from Bernie Engel, Dean of the Purdue College of Agriculture, followed by a distinguished lineup of speakers, including keynote presenter William Aderholt, co-founder and executive director of Grand Farm, along with leaders from Purdue University, the University of Illinois, Cornell University, and agricultural industry organizations. Sessions will examine the opportunities and challenges surrounding AI adoption, digital decision-support tools, and the future of agricultural innovation.

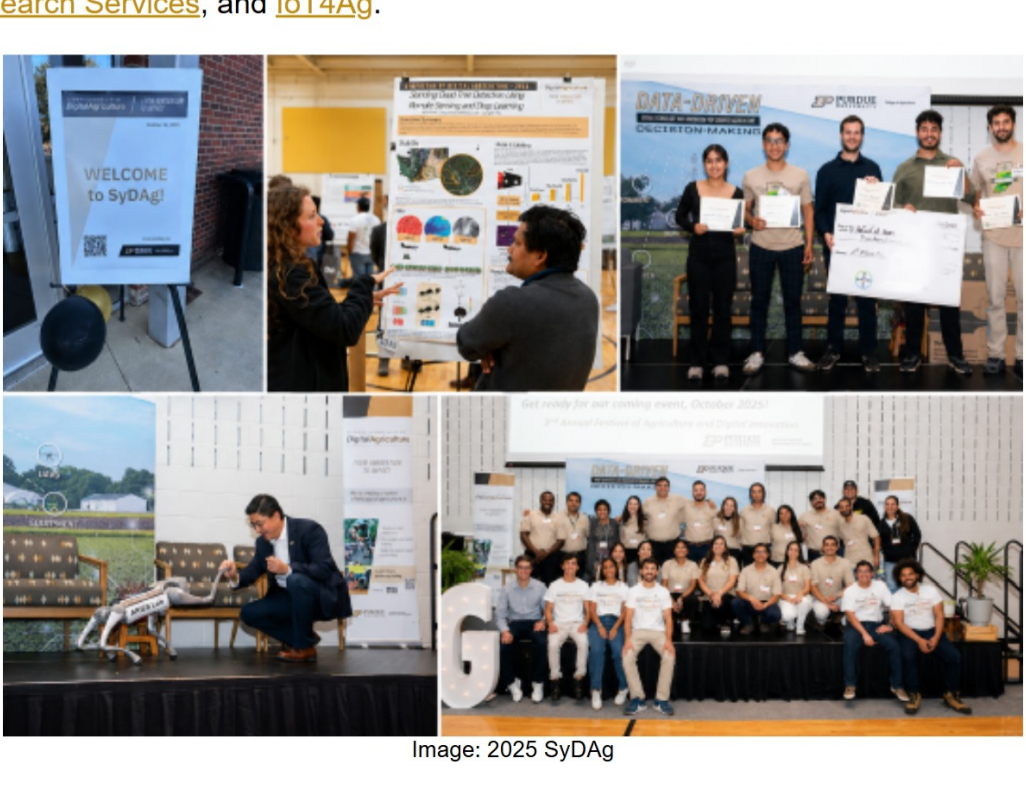
The symposium will continue its popular student and research poster session, providing participants with an opportunity to share their work, build professional connections, and highlight innovations advancing the future of food and agriculture. Consistent with SyDAg's mission, the event is designed to foster interdisciplinary collaboration, expand understanding of emerging technologies, and support the development of the next generation of digital agriculture professionals.

A key feature of SyDAg 2026 will be an expanded technology showcase, featuring emerging digital agriculture tools and technologies, including drones, robotics, and other innovative solutions. Attendees will have opportunities to see technologies in action through live field demonstrations, interact with industry leaders, and learn how these tools are being applied to address real-world challenges in agriculture.

The SyDAg Hackathon will take place September 25–27 in the Agriculture and Biological Engineering building, bringing together students from diverse academic backgrounds to collaborate on innovative solutions to challenges facing modern agriculture. Teams will draw on expertise in agriculture, engineering, data analytics, computer science, and artificial intelligence while working on practical problems relevant to growers and industry stakeholders.

Throughout the weekend, participants will work with mentors, refine their concepts, and ultimately present their solutions to a panel of judges. The hackathon continues SyDAg's commitment to creating opportunities for students to apply their skills to real-world agricultural challenges and turn innovative ideas into meaningful impact.

The 2026 Hackathon is made possible with support from Bayer, AgriNovus, Purdue Research Services, and IoT4Ag.


Image: 2025 SyDAg

Research Spotlight

Gustavo Rodrigues: Where Precision Dairy Meets Genomics



Gustavo Rodrigues is a second-year PhD student in Dr. Luiz Brito's lab in the Department of Animal Sciences. His research focuses on using precision dairy technologies and genomic information to better understand economically and biologically important traits in dairy cattle.

Gustavo works with large datasets collected from a commercial dairy farm in Indiana that uses automatic milking systems (AMS). These systems continuously collect detailed information from individual cows during each milking, creating unique opportunities to study traits that would otherwise be difficult or expensive to measure on a large scale. Depending on the dataset and trait being evaluated, we have access to more than 10 million individual milking visits from nearly 10,000 cows.

A major part of Gustavo research involves using data generated by the milking robots to develop and evaluate novel phenotypes. These include udder conformation traits, milk temperature, milk electrical conductivity, milk production and composition, as well as indicators related to animal health and resilience. He is particularly interested in understanding the genetic basis of these traits and evaluating how precision livestock technologies can provide new information for genetic selection and dairy herd management. We also use different longitudinal modeling approaches to evaluate these traits over time and to investigate the role of permanent environmental effects.

Ultimately, his research aims to transform the large amount of data routinely generated on commercial dairy farms into useful information that can support the development of healthier, more resilient, and more efficient dairy cattle.

Extension Spotlight

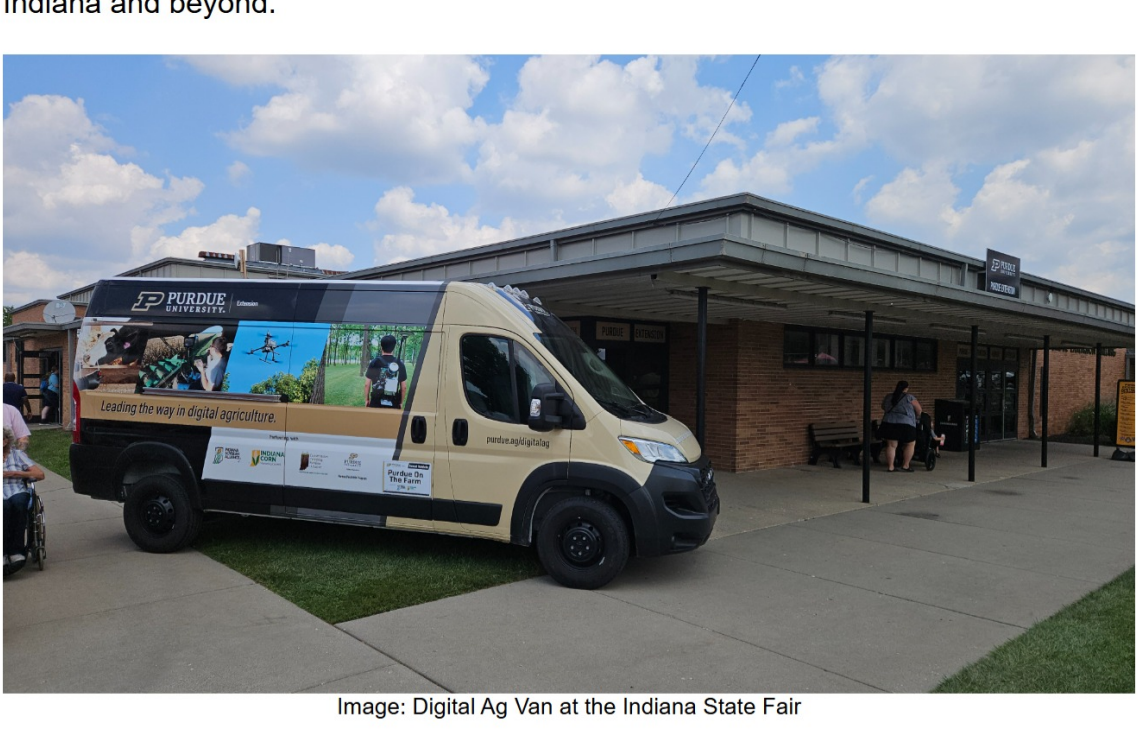
Extension Highlights from August

August was a busy month for Purdue Extension, with programming focused on UAV technology, farmer engagement, education, and professional development. Extension staff conducted UAV flights at several locations, including Elkhart County PARP, Pinney Purdue Field Day, and ACRE farmer and fertilizer programs.

Outreach efforts also included six presentations and demonstrations, connecting with more than 200 farmers, educators, and community members. Highlights included UAV seeding and regulatory demonstrations, a display at the Indiana State Fair, a demonstration for 52 farmers from Argentina, and programming for The Fertilizer Institute's Agronomy Conference.

Extension staff also provided 21 individual consultations, including 10 with farmers, seven with educators, and four with teachers, and continued professional development through meetings, training opportunities, leadership activities, and grant work. Additional accomplishments included passing the CCA Regenerative Specialty Exam and judging poster projects at the Indiana State Fair.

Together, these efforts demonstrate Purdue Extension's continued work to connect emerging agricultural technologies with farmers, educators, and communities across Indiana and beyond.


Image: Digital Ag Van at the Indiana State Fair

Congratulations to Purdue's Extension's Adam Shanks

Adam Shanks has been awarded a $120,000 Professional Development Program grant from the Sustainable Agriculture Research and Education (SARE) program for his project, "Improving Digital Skills of Agricultural Educators and Advisors."

As project coordinator, Adam Shanks will lead this initiative through October 2029, helping agricultural educators and advisors across Indiana and the broader North Central region strengthen their skills in digital agriculture, precision agriculture technologies, and uncrewed aerial vehicles (UAVs/drones).

By building technology knowledge among agricultural professionals, the project will help ensure farmers have access to knowledgeable, up-to-date guidance as agriculture continues to become more data-driven and technology-enabled.

Congratulations, Adam, on this well-deserved award and on this important work advancing digital agriculture education!

Don't stop reading just yet, there's a challenge waiting for you at the end!

Education Spotlight

AgBridge Team Earns ASABE Blue Ribbon Award



Congratulations to the SPRING team from IoT4Ag AgBridge 2025, which recently received an ASABE Blue Ribbon Award recognizing the team's outstanding work!

The SPRING team was part of the 2025 AgBridge program, an initiative designed to give teachers and students hands-on experience with emerging technologies in agriculture while building skills and connections across education, research, and industry.

The momentum continued this summer with the completion of the AgBridge 2026 and SURF 2026 programs.

Both programs provided participants with opportunities to explore digital agriculture, engage in research, and gain hands-on experience alongside Purdue faculty, educators, and volunteers.

Four undergraduate students participated in the SURF 2026 program, with each presenting their research at the research symposium. One of the students was recognized with a Presentation with Distinction Award for their presentation.

With both programs recently wrapped up, participants have a fresh perspective on their experiences and the skills, knowledge, and connections they gained. Their stories provide an opportunity to highlight the impact of these programs and the growing role of digital agriculture in preparing the next generation of agricultural professionals.

We're proud to celebrate the accomplishments of these students, teachers, and volunteers and the continued growth of opportunities that connect digital agriculture, education, and hands-on research.


Image: Collage of participants in the AgBridge Program

Agriculture Courses Building AI and Digital Skills

Interested in building your knowledge of artificial intelligence, computing, and emerging digital technologies as they apply to agriculture? Purdue offers several agriculture-focused courses that incorporate AI and digital skills into the curriculum.

Here are a few courses to explore:

AGR 59500 – Research Fundamentals in the Era of AI (CRN: 32041)
Semester offered: Fall 2026
There's still time to enroll in the course, as it won't begin meeting until after fall break.
This course examines research fundamentals in the era of artificial intelligence, providing students with an opportunity to explore how AI is changing research practices and approaches within agriculture and related disciplines.

AGEC 26100 – Strategy and AI in Society, Markets, and Decision Systems
Semester offered: Fall 2026
This course explores artificial intelligence and its applications in economic, market, and decision-making contexts, helping students consider how AI can influence strategy and decision systems.

ASM 10500 – Computing Technology with Applications
Semester offered: Spring 2027
Students use computers to solve problems related to agricultural technology and businesses, with an emphasis on spreadsheets, data analysis, decision aids, communication tools, and cloud-based applications.

BTNY 11000 – Introduction to Plant Science
Semester offered: Fall 2026 and Spring 2027
This introductory course explores the major groups of plants and their origin, classification, and economic importance, while covering areas including anatomy, physiology, biochemistry, molecular biology, genetics, and ecology as they relate to plant science and agriculture.

FS 47300 – AI Applications in Food Science and Industry
Semester offered: Fall 2026 and Spring 2027
This course focuses on applications of artificial intelligence within food science and the food industry, providing students with an opportunity to explore emerging AI technologies in food-related contexts. Purdue identifies FS 47300 among its agriculture-related courses incorporating AI concepts and applications.

These courses are part of a broader effort to integrate AI, computing, data, and emerging technologies across Purdue's agricultural curriculum, giving students opportunities to develop skills that can be applied to the increasingly technology-driven agriculture, food, and natural resources sectors.

Upcoming Conferences & Workshop

Growing with AI: Registration Open for SyDAg 2026

Last chance to register for the 2nd Symposium of Digital Agriculture (SyDAg)

Date: September 28, 2026
Time: 8:00 AM – 5:00 PM
Location: Beck's Center at ACRE

SyDAg is a student-led event that brings together students, researchers, educators, and industry professionals to explore innovation and emerging technologies in agriculture. This year's theme "Growing with AI", will highlight how artificial intelligence and digital technologies are shaping the future of the agricultural industry. The symposium will bring together emerging leaders and established experts to explore how innovations in digital and AI-driven agriculture can address pressing challenges across production, management, and supply systems.

We encourage you to learn more and register at: SyDAg Registration Website

Stay connected with SyDAg:

Instagram: @purduesydag

LinkedIn: Symposium of Digital Agriculture (SyDAg)

Interested in joining the organizing committee? Reach out to the IDAAS Grad Student Association to get involved!

GIS Day 2026

Save the Date for Purdue GIS Day 2026 on Thursday, November 12 Purdue Libraries and School of Information Studies invites all students, faculty, staff, industry professionals, and beyond to register for and attend Purdue GIS Day 2026: Cyber GIS & Geospatial Data Science on Thursday, November 12, 2026, starting at 8:00 AM in Stewart Center 214.

Register by October 25, 2026 to ensure your place in this year's GIS conference, receive a free T-shirt, and attend the career panel lunch. Registration and poster proposals

Purdue + Google AI Summit

Purdue University and Google are teaming up this fall for the 3rd Annual Purdue + Google AI Summit, bringing together industry leaders, researchers, government representatives and innovators to explore how AI is moving from experimentation to real-world applications. The summit will feature keynotes, breakout sessions, hands-on Google AI demonstrations, networking and industry panels, including a focus on agriculture.

Learn more and register for the AI Summit.

38th Burton D. Morgan Venture Concept Competition

Purdue students interested in entrepreneurship and innovation are invited to participate in the 38th Burton D. Morgan Venture Concept Competition. With $100,000 in prizes available, the competition offers students an opportunity to develop an idea, build their entrepreneurial skills, connect with others, and compete for funding.

The competition includes six workshops at The HIVE from September through December, providing participants with opportunities to learn, network, and build their venture concepts. The program culminates on December 11, when participants can compete for prizes.

The competition is open to all Purdue students. Concept submissions are due September 27.

Learn more and enter: Scan the QR code on the flyer or visit the competition information page.



Image: Flyer for the competition

Digital Ag in the News

AI in Agriculture: From Discussion to Doing

IDAAS Co-director Dennis Buckmaster engaged with industry and non-profit stakeholders at the latest Agrinovus Quadrant. Bringing an academic perspective to the panel, he highlighted things Purdue and IDAAS are doing with regard to AI curriculum, research, and Extension. Christy Wright, Agrinovus CEO, moderated the panel and sparked some lively and informative discussion about where and how firms should begin using AI. The panelists covered some very impactful success stories and gave the audience some tips and strategies regarding responsible and productive use.


Image: AGN Quadrant Panel

Future-proofing agriculture research: FAIR principles for agriculture AI agents (FAIR4AG2)

A new perspective published in Frontiers in Artificial Intelligence introduces FAIR4AG², a proposed framework for making agricultural research more accessible and usable by emerging AI agents. The authors build on the established FAIR principles,Findable, Accessible, Interoperable and Reusable—and extend them to address the needs of AI systems that can autonomously discover, interpret and use research data, models and tools.

The article highlights the importance of machine-readable research, standardized metadata, accessible data and models, clear provenance, structured multimedia, and human oversight. For agriculture, where valuable knowledge is often spread across research papers, Extension publications, technical reports, databases and field demonstrations, the authors argue that improving this infrastructure could help AI agents more effectively support research and decision-making.

Read the full article.

NOW THE CHALLENGE...

I am a firm believer in the 4-H slogan "learning by doing". So this month, I offer this 15-20 minute challenge that requires you to do something, maybe while eating lunch, with a genuine reward for the winner. We reserve the right also to declare more than one winner!

First, the benefit (aside from a possible prize):

> Whether you have done vibe coding or not, here is your chance to generate a useful tool and learn how easy it is to do so. I hope this example inspires you to do something similar in your realm of expertise. You can use any generative AI model to get this done. Of course, if you are a coder, you can do it yourself. For many of you, this exposure to "there exists a thing called a single-file web app" will be enlightening.

Now the challenge (and I am using terms here that you can directly repurpose in your prompting, so if you are a novice, be assured you can still succeed and do so quickly):

> **Vibe code a simple single-file HTML app to estimate materials for a high-tensile fence installation**. I have made some assumptions here to simplify this challenge, but this is very realistic. *This is actually a repurposing of a spreadsheet exam problem I have used in the past.* Here is a rambling version of the information you need, along with a picture to help you visualize the situation.


Image: Corner of a 3-wire high-tensile fence illustrating insulated/electrified wires, tensioners, support posts.

This is approximate. The user would input the total length of the fence (perimeter, that is) and indicate how many wires, with common choices from 4 to 8. They would indicate how many wires are insulated (electrified). Every fence needs one charger and one ground rod. The number of posts would be fence length divided by spacing (which might be 15 to 30 feet).

There are also posts needed for corners and ends, using the rules that each corner requires 4 extra posts, and each end needs 2 extra posts. Those extra posts also need "pins". Let's put one tensioner on each wire. The number of insulators is approximately the number of posts times the number of electrified wires. The number of staples would be approximately the number of wires times the number of posts, but add 10% as a safety factor. We'll need crimpers to the tune of about the number of wires times the sum of ends plus corners; better add a few spares, too.

You'll want to be able to export (echo) the inputs and outputs as a CSV (comma-separated values) file that could be shared/sent and opened in a spreadsheet, text editor, etc. You might get bonus points to break a tie between wonderful tools if you use a Purdue-branded color scheme.

Oh yes, the rules:

Eligible participants are all Purdue faculty and staff. We might declare two (faculty and staff) winners. Send your HTML file as an email attachment to digitalag@purdue.edu by noon on October 2. I will "employ" a couple of students to assist the judging of the submissions. The winner(s) will receive some IDAAS SWAG and a sampling of some of Indiana's most fabulous popcorn. Please flood our inbox with submissions. Enjoy the challenge. And most importantly, take note of what you learn and consider how you could generate similar tools in your realm. Also ponder … it would not be difficult to add a price list to turn this materials estimate into a pricing estimator.

Wishing you the best,

Dennis R. Buckmaster

Open Position

The ELLIS Institute Tübingen and partners are seeking an innovative Postdoctoral Researcher / Scientific Project Co-Lead to help advance the future of agroecology through machine learning, computer vision, and robotics. This unique position will lead interdisciplinary research focused on developing AI-driven solutions for diversified agricultural systems, with the goal of enhancing productivity, biodiversity, climate resilience, and sustainability. The role combines cutting-edge scientific research with project leadership, collaboration across academia and industry, and the implementation of on-farm research initiatives. Researchers with expertise in machine learning, robotics, computer vision, or related fields are encouraged to explore this exciting opportunity to make a lasting impact on the future of agriculture.

For more information, visit their website.



ellis | MAX PLANCK INSTITUTE FOR INTELLIGENT SYSTEMS | EBERHARD KARLS UNIVERSITÄT TÜBINGEN | machine learning new perspectives for science | TERRA

Open Position for impact-driven (Postdoctoral) Researcher / Scientific Project Co-Lead

Machine Learning, Computer Vision & Robotics for Agroecology

ELLIS Institute Tübingen – Robust Machine Learning Group
in strong collaboration with Max Planck Institute for Intelligent Systems and University of Tübingen
LOCATION: Tübingen and/or Freiburg

We are looking for a highly motivated researcher / machine learning engineer to take a leading role in building an ambitious, interdisciplinary and impact-driven research project at the intersection of machine learning, computer vision, robotics and ecological diversification of agricultural systems.

Our Mission & Vision

The diversification of agricultural systems holds immense, largely untapped potential to redesign agricultural production systems so they can operate within planetary boundaries while increasing productivity, biodiversity, climate resilience and carbon sequestration at the same time. Until now, practical implementation has been hindered by management complexity and costs, but advancements in Physical AI, including AI-driven monitoring, digital twins, and adaptive robotics, now offer a path to making these systems economically scalable. Our initiative acts as a strategic bridge between the Excellence Clusters Machine Learning, TERRA, and Future Forests (Freiburg) to build a regional innovation ecosystem, spanning from fundamental research to practical industry and agricultural transfer.

Vision of robotic diversified agroforestry (AI generated)

The goal is to develop AI- and robotics-enabled approaches for agroforestry, agroecology and the sustainable transformation of agriculture. Working closely with an agroecology expert and jointly coordinating an interdisciplinary consortium, you will combine scientific research with strategic project development, network building, and the preparation of major collaborative funding proposals as well as the implementation of our on-farm research sites.

Your responsibilities

- Co-develop and implement the scientific strategy and technical framework of the research program.
- Design machine-learning, computer vision, and robotics approaches for complex agricultural environments.
- Translate ecological challenges into concrete AI and robotics research questions.
- Develop research proposals, funding strategies and collaborative projects.
- Build and coordinate partnerships across academia, industry, agriculture and society.
- Establish pilot studies, living labs and on-farm research sites.
- Coordinate partners, milestones and communication across disciplines.
- Become a member of our core team, with the vision to shape and grow this initiative over the long term.

Your profile

- Strong coding skills and experience with modern machine-learning and deep-learning methods.
- Ideally, expertise in areas such as VLAs, robot perception, visual learning, multimodal sensing or autonomous systems.

1 ELLIS Institute Tübingen · Machine Learning, Computer Vision & Robotics for Agroecology

Connect with IDAAS as an Affiliate

The Institute for Digital and Advanced Agricultural Systems (IDAAS) invites Purdue faculty and staff to become affiliates and join our growing network of researchers and innovators. Affiliates are engaged in areas such as digital agriculture, AI, advanced sensing, data analytics, automation, and related technologies that are shaping the future of agriculture and food systems.

The challenges in these fields are complex and rapidly evolving. Tackling them requires a collaborative, transdisciplinary approach, one that aligns closely with Purdue's Land Grant Mission of building human capital, advancing solutions to pressing global challenges, and partnering deeply with industry and community stakeholders.

To be included in the IDAAS directory of faculty and staff affiliates, please complete the short survey below:

- New affiliates: fill out the form to be added.
- Current affiliates: use the same form to update your information.

Affiliate Form – IDAAS Directory

Explore the latest from IDAAS—click here to stay connected!

Digital Identity

What is Digital Agriculture? It's the use of digital devices to gather, process and analyze spatial and/or temporal data. This data can then guide targeted actions to improve agricultural efficiency, productivity and sustainability.

Contributions to this newsletter are welcomed. Please send your ideas, ideally about one paragraph with links and a photo, to digitalag@purdue.edu.

IDAAS newsletters are compiled and edited by Melinda Smith.