DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

UNIVERSITY OF ARKANSAS | College of Engineering
Biological & Agricultural Engineering

BIOLOGICAL AND AGRICULTURAL ENGINEERING
LIFE LINE

Spring 2023

OUR MISSION IS TO DEVELOP

SUSTAINABLE WATER, FOOD, ENERGY,

AND RELATED SYSTEMS THROUGH

INNOVATION IN TEACHING, RESEARCH,

EXTENSION, AND ECONOMIC

DEVELOPMENT VIA TECHNOLOGY TRANSFER.

From the Department Head

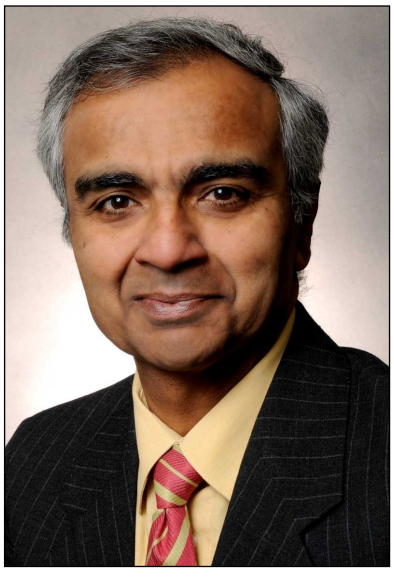
The spring 2023 semester concluded successfully with our commencement ceremonies on May 13th with 25 graduates of the B.S. in Biological Engineering graduates. Recognition of graduating seniors and scholarship recipients was held during the Annual Induction Banquet of the Arkansas Academy of Biological and Agricultural Engineering (AABAE) on April 14th. The AABAE inducted three new members at this ceremony. The 2023 inductees are Dr. C. Nathan Jones, Asst. Professor of Ecohydrology at the University of Alabama, Dr. Michael May, M.D. a family medicine physician in Fayetteville, AR and Mr. Harvey Williams, co-founder and CEO of Delta Dirt Distillery in eastern Arkansas. Dr. Indrajeet Chaubey, Dean and Director of the University of Connecticut College of Agriculture was honored as a College of Engineering Distinguished Alumnus and Dr. Michael May, M.D. as an Early Career Alumnus on April 15 at the Engineering Alumni Banquet.

Seven senior design teams presented their capstone design projects during the Biological Engineering Design Expo on May 4 to faculty and guests. These teams were mentored by Drs. Scott Osborn, Ben Runkle, Tom Costello, Marty Matlock, Yi Liang and Jun Zhu. Graduating seniors looking for employment have been successful again in securing engineering positions with most of them successfully completing the F.E. exam. Congratulations to our graduates and sincere gratitude to our faculty and staff.

Ms. Kendele Kramer was honored as a College of Engineering Outstanding Senior Finalist and the Biological Engineering Outstanding Senior. Drs. Scott Osborn, Yanbin Li and Ben Runkle were the recipients of the department's outstanding teaching, research and service-to-students awards, respectively and Mr. Jake Anderson was named the outstanding staff on May 5 at the College of Engineering faculty-staff meeting.

Please send us your news and updates and your continued interest in our programs is appreciated. Please consider supporting our programs through the opportunities listed in the newsletter or on our website and feel free to seek additional information. We are looking forward to having a new leader for our department as I plan to retire on July 31st.

This being my last newsletter, I wish to thank all the faculty, staff and students who have contributed over the last 23 years in making our programs relevant, impactful and in service of our stakeholders. Our profession and expertise could not be any more important than it is today in addressing the challenges facing our society. I am quite confident that we will continue to contribute and wish the next leader all the success. It has been and honor and pleasure being in this role since 2000.



Check us out at www.bio-agengineering.uark.edu

Sincerely,
Lalit Verma

Arkansas to lead $5 million grant-established center to advance robotics in poultry processing

Researchers in Arkansas and two other states will be using a $5 million grant to increase use of artificial intelligence and robotics in chicken processing to reduce waste in deboning and detect pathogens.

The grant from the U.S. Department of Agriculture's National Institute of Food and Agriculture will establish the Center for Scalable and Intelligent Automation in Poultry Processing. The center, led by the University of Arkansas System Division of Agriculture, will join researchers from five institutions in three states in efforts to adapt robotic automation to chicken meat processing.

Project director Jeyam Subbiah said the Arkansas Agricultural Experiment Station, the research arm of the Division of Agriculture, will receive $2.2 million from the grant primarily to focus on food safety automation for poultry processing plants. The grant is for four years.

Subbiah is a professor and head of the food science department for the Division of Agriculture and the Dale Bumpers College of Agricultural, Food and Life Sciences at the University of Arkansas.

The Georgia Institution of Technology, better known as Georgia Tech, is a major partner in the project, Subbiah said. $2.1 million of the grant will go to Georgia Tech to focus on automating the processing lines that turn chickens into meat.

The remaining grant money will be divided between Julia McQuillan, Willa Cather professor of sociology at the University of Nebraska-Lincoln, and Brou Kouakou, associate dean for research at Fort Valley State University in Georgia.

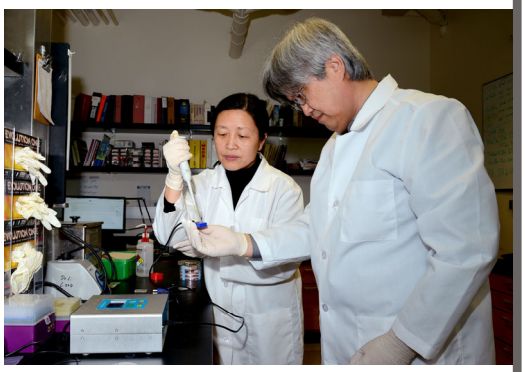
Jeff Buhr, a USDA Agricultural Research Service scientist, will contribute his expertise in broiler physiology to guide robotic deboning of meat, Subbiah said.

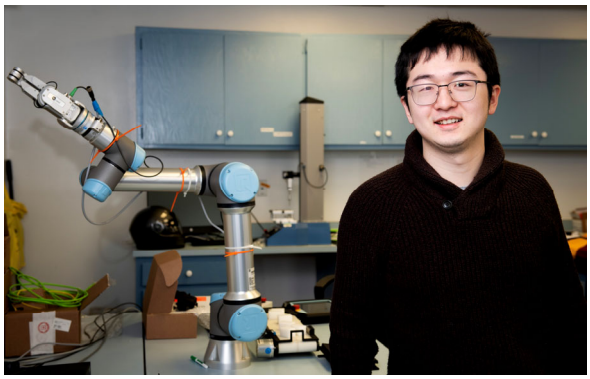
Georgia is the nation's top broiler producer. Arkansas is number 3, according to 2021 figures from USDA.

Research team

Arkansas' research will involve scientists from at least three departments:

Dongyi Wang and Yanbin Li from biological and agricultural engineering—Wang also has an appointment in food science, and Li is affiliated with the Center of Excellence for Poultry Science





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Arkansas Engineering Faculty Member Recognized for Outreach to Aid Poultry Sustainability Efforts

Yi Liang was awarded the John W. White Outstanding Extension State Faculty Award

Dr. Ubeyitogullari has received two USDA-NIFA projects to develop 3D food printing approaches for the delivery of bioactive compounds. Dr. Ubeyitogullari's Ph.D. student, Arda Tuhanioglu, won 1st place in the IFT Sustainable Food Systems Division Oral Competition. He has also been selected to receive the 2023 Jogue Inc. Scholarship ($2,000) by the Society of Flavor Chemists. His graduate students, Sumanjot Kaur and Arda Tuhanioglu, received 1st place in the Student ePoster and Pitch Competition at the 2023 American Oil Chemists' Society Annual Meeting & Expo. Dr. Ubeyitogullari was featured in the Behind the Discovery channel of the University of Arkansas Division of Agriculture. Dr. Ubeyitogullari hosted two visiting graduate students from Ghent University (Belgium) and University of Applied Science, Weihenstephan – Triesdorf (Germany). Dr. Ubeyitogullari teaches FDSC 3103: Principles of Food Processing and FDSC 2201: Science of Chocolate.

Student news from Dr. Ubeyitogullari:

At the AOCS Annual Meeting (April 30 - May 3), my Ph.D. student, Arda Tuhanioglu, won first place in the "general group" category, and my M.S. student, Sumanjot Kaur, won first place in the "protein and co-products group" category poster competitions. These were the only two categories at the conference. Arda was also the recipient of the Honored Student Award (one of the most prestigious student awards by the AOCS). AOCS: American Oil Chemists' Society.

High-tech cameras focused on chicken breast defect detection

Some research for poultry processing automation is more than meets the eye.

A multidisciplinary team of scientists at the Arkansas Agricultural Experiment Station are testing to see if hyperspectral images can be used to detect a chicken breast defect known as “woody breast” that costs the poultry industry millions of dollars annually and decreases customer satisfaction.

Dongyi Wang, assistant professor of biological and agricultural engineering, explains that hyperspectral imaging is a non-invasive sensing technique that combines a near-infrared sensor with a high-definition color camera to capture physical and chemical information.

“The current evaluation procedure is time-consuming and needs a sample tested through cumbersome laboratory tests,” Wang said.

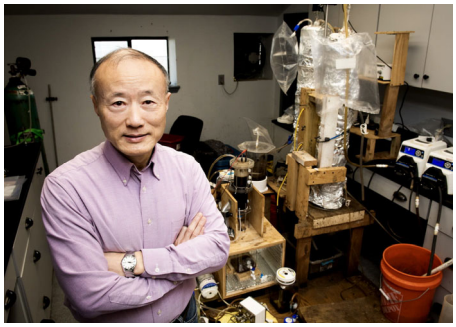
Woody breast detection with a hyperspectral camera system would take just a few seconds with a compute instead of grading by hand.

“Woody breast detection by hand can be labor intensive,” said Casey Owens, the Novus International Professor of Poultry Science at the experiment station. “If hyperspectral imaging can be used in a poultry processing plant, that labor force could be diverted to another area.”

Owens said woody breast affects up to about 20 percent of chicken breast meat. Although it can be diverted for further processing, the loss in premium as a whole-muscle product accounts for a yield loss worth about $200 million annually in the United States, Wang said.

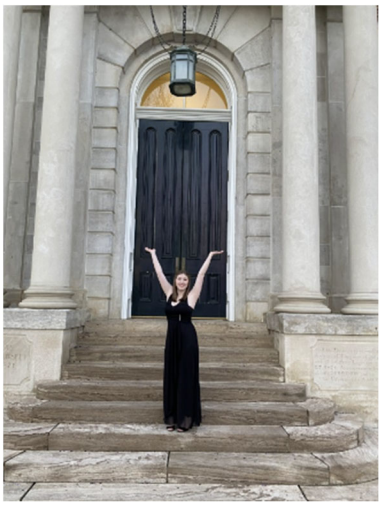
BAEG Life Line

Graduates from last year – Alexis Barber, Harrison Davis, and Nathan Bowman, who were recognized (Along with absent team members) for their awards last summer at the ASABE meeting in the student environmental design competition.



ONE-OF-A-KIND — Jun Zhu, professor of biological and agricultural engineering, stands before a prototype of the liquid-state poultry litter digester designed to recycle water used in creating struvite from poultry litter. The system also captures biogas from liquid-state anaerobic digestion of poultry litter.

Post Doctoral Fellow Swarna Sethu won best paper for her presentation: Sensory Predictive Analysis of freshness of Food Products under Different Lighting Conditions at the 2023 IEEE International Conference



Emily Tappana was named 2023 ASABE Outstanding senior

Alumni Kendrick Hardaway (BENG 2018) was recently awarded a Fulbright Scholarship to perform research at the Univ of Canterbury, New Zealand, on resilience and climate adaptation planning. He will work with a professor of engineering, Tom Logan, from early 2024. After Fayetteville, Kendrick has been pursuing a Ph.D. at Purdue University, where he researches climate adaptation for infrastructure systems and the environmental impacts of emerging technologies. He specifically focuses on trying to capture missing or not-yet-understood feedback loops in models of these systems. He has also started a partnership with researchers in Athens, Greece, to help with an EU Horizon project on climate resilience and with the Food, Agriculture, Biodiversity, Land-Use, and Energy (FABLE) Consortium. Following the Fulbright, he plans to pursue a career in academia to continue doing exciting research and working toward collective environmental solutions.

Dr. Benjamin Runkle is the co-investigator of the National Institute of Food and Agriculture grant, it is led by a colleague at the University of Delaware, Angelia Seyfferth, it is funded by the USDA's Food Safety group. My part, funded at $316,000 over 4 years, will help test ways to predict and manage the potential for arsenic to migrate into rice grains from the soil while rice grows in the field. It will support a postdoctoral researcher as well as undergraduate assistants.

Student Industry Tour

The 2023 Industry tour took place at Hiland Dairy, Delta Plastics and Diamond Bear Brewery in Little Rock, Arkansas.

2023 Graduate Reception

Senior Design Expo

On May 4th 2023 seniors presented their Senior Deign Projects to faculty, staff and mentors.

Congratulations to the Class of 2023!

Undergraduates:

Craigon Anderson

Lauren Brasco

Annette Benbrook

Leo Black

Spencer Briggs

Sarah Flannery

Conor Germann

Kyson Hardaway

Neily Hardy

Natalie Harris

Ava Hatch

Mariel Kasman

Kendele Kramer

Juniper Matlock

Oscar Morton

Kyler Phan

Kyrie Potter

Christopher Pryor

Hailey Roye

Hunter Shelby

Dharma Shepard

Katherine Skiles

Zachary Stanley

Emily Tappana

Cody Wendtland

Scholarship Donation Opportunities

Please accept my contribution to the following scholarship(s). My check for

$ _____ is enclosed.

Billy Bryan Scholarship Fund $ _____

Joel T. Walker Memorial Scholarship Fund $ _____

Carl L. Griffis Memorial Scholarship Fund $ _____

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Have a great year!