



INDUSTRIAL AND SYSTEMS ENGINEERING NEWSLETTER

Fall 2023



Here in the Auburn University Department of Industrial and Systems Engineering (ISE), we are excited to begin a new academic year. As we have seen recent growth and achievements in the department, the beginning of a new year is the perfect opportunity to share those changes with you.

Over the summer, we added three new faculty members to our team. Rongxuan (Raphael) Wang joins us after recently earning his doctoral degree from Virginia Tech. His research focus is in advanced manufacturing systems and he is a great addition to our Auburn University Interdisciplinary Center for Advanced Manufacturing Systems (ICAMS) team.

Edward Huang has most recently served as an associate professor of systems engineering and operations research at George Mason University. Dr. Huang's research focuses on the design aspect and analysis of facility design. He has extensively utilized model-based systems engineering methodologies for various defense and aerospace systems. His charge is to make our systems engineering program among the top programs in the country.

Our newest addition, Allison Ledford, is a recent doctoral graduate of our department. Dr. Ledford's research focus is digital engineering and manufacturing and she will serve as an assistant research professor at Auburn's Research and Innovation Campus in Huntsville, furthering our research collaborations and efforts in the Huntsville area.

Student achievements throughout the summer included eight Auburn University students completing their Mechatronics Certificate through our partnership with Southern Union State Community College, and seven ISE doctoral students earning their Ph.D.

Several members of our faculty and staff, along with 28 engineering students, recently returned from a successful trip through our summer study abroad program in Pamplona, Spain! These students had the opportunity to gain real-world experience working on projects with a European company. One ISE student described the experience as one of the best she has had throughout her college career, and in life. We plan to return to Spain next summer and also plan to add Germany as a second destination.

We are excited about the direction the ISE department is headed and invite you to read more about our work below.

War Eagle!

Greg Harris

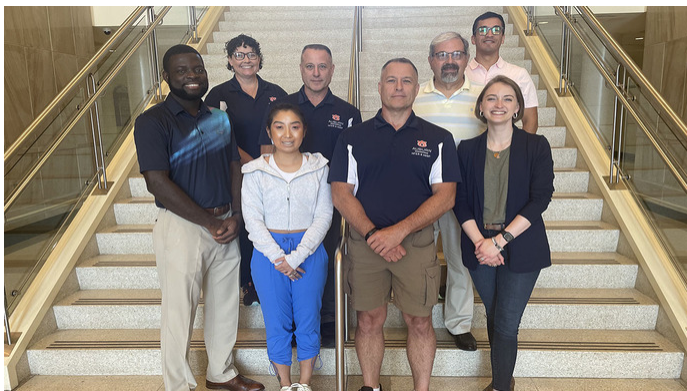


Auburn Engineering undergraduate programs ranked among U.S. News and World Report's Top 30 public institutions

Auburn University's Samuel Ginn College of Engineering was again recognized as a national leader in higher education, ranking among the nation's top public institutions in U.S. News & World Report's 2024 Best Undergraduate Engineering Programs for the 13th-consecutive year. The publication, which ranks undergraduate programs throughout the nation each fall, ranked Auburn Engineering No. 30, up three spots from No. 33 last year.

"Our consistent ranking among the top colleges across the country continues to validate the Samuel Ginn College of Engineering as a national leader in education and research, and it recognizes our mission of providing the best student-centered engineering experience in America," said Mario Eden, dean of engineering. "Not only is this ranking a testament to our continued commitment to excellence, but it demonstrates that peer institutions recognize Auburn Engineering among the nation's elite."

Auburn Engineering also ranked No. 3 among public institutions in the Southeastern Conference and again No. 1 in the state. The college produces one-third of the state of Alabama's engineering graduates annually and boasts several prominent alumni, including four astronauts and Tim Cook, CEO of Apple.



Doctoral students awarded safety scholarships

Five ISE doctoral students, and six Auburn University students in all, have been awarded scholarships through the American Society of Safety Professionals (ASSP) totaling \$25,000.

For the third consecutive year, ISE doctoral student Bob Sesek was awarded an ASSP Foundation Scholarship, funded by Carole and James Stevens in memory of Steven F. Kane. A leader in the safety profession, Kane died in a tragic bicycle accident caused by a motorist on the wrong side of the road in 2012.

Sesek said he was honored to be a three-time recipient of the Steven F. Kane Memorial Scholarship.

"I feel that Steve and I would be kindred spirits in our approach to both safety and life in general," he said. "I am an avid cyclist, as was Steve, and enjoy riding for both pleasure and as my primary means of travel to Auburn for my research and teaching responsibilities and I just crossed 4,000 miles on my current bicycle. The ASSP scholarship helped me to attend the ASSP Safety Conference and purchase new saddlebags for my bicycle. Every day that I load my bike to go to Auburn, I am thankful for Steve's gift."



ICAMS hosts Industry 4.0 Workshop

The Auburn University Interdisciplinary Center for Advanced Manufacturing Systems (ICAMS) recently partnered with the Alabama Automotive Manufacturers

Association to host an Industry 4.0 Workshop for industry and academia. Participants included employees from companies such as Honda and Hyundai as well as researchers from universities such as the University of Alabama at Huntsville and the University of Mississippi.

The workshop, hosted at ICAMS on June 22, focused on traditional manufacturing meeting the ever-evolving world of digital transformation. It explored the adoption of new technologies and cyber-physical systems, disruptive trends in data acquisition, implications to the industrial workforce and more.

Ron Davis, president of the Alabama Automotive Manufacturers Association, voiced his excitement about learning more about Industry 4.0 as he opened the meeting before introducing ICAMS Director Greg Harris.

"We really want to learn from you throughout this workshop," Harris said. "And hopefully you'll learn from us as well."



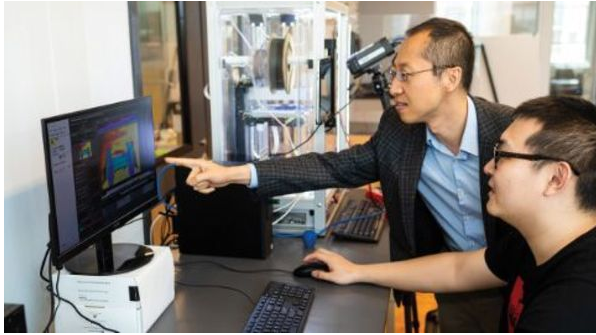
Honda enters educational partnership with College of Engineering

The Honda Alabama Auto Plant (AAP) and the Auburn

University Samuel Ginn College of Engineering recently entered into an educational partnership

through which more than 15 Honda associates will pursue graduate certificates through the Auburn University Department of Industrial and Systems Engineering (ISE).

"The opportunity to pursue Auburn graduate certificates in Industrial and Systems Engineering is closely aligned with Honda's core values and principles that encourage associates to dream and pursue their passions," Stephen Woodry, quality leader for the Alabama Honda facility, said of the partnership. "The certificates offer a comprehensive curriculum that will provide our associates with the knowledge and skills they need to continue to grow and enhance their skills in an area they are passionate about. By investing in the education and development of our associates, we empower them to become more effective leaders, which benefits both our associates and the company as a whole."



ISE assistant professor earns NSF CAREER Award

Four years ago, GE Aerospace transitioned to using additive manufacturing (AM) for their new

Catalyst turboprop engine. This meant that 800 traditionally manufactured components were consolidated into just 12 metal AM parts, the development cycle was dropped from 5-10 years to only two, the engine weight reduced by 5% and the fuel consumption improved by 1%. For G.E., that's a pretty big deal. If other U.S. aircraft manufacturers went the same route, that would be a pretty big deal for the planet.

There's a reason AM research across the globe is expected to push \$24 billion by 2027, and the revolutionary impact on the aviation industry is one of them. Experts estimate that substantial adoption of 3D-printed parts could knock 200 million gallons off of annual aviation fuel consumption.

If the parts work.

Despite the demonstrated success of metal additive manufacturing in various industries, the performance uncertainty of AM parts undermines the potential of deploying AM for high-consequence applications. Air travel. Space travel. Those sorts of thing.

This is why the National Science Foundation (NSF) is turning to Peter Liu, assistant professor of industrial and systems engineering, in the form of a \$500,000 CAREER Award meant to generate new insight into defect formation relevant to fatigue performance of parts manufactured through laser powder-bed fusion (LPBF) and uncover the synergistic impacts of multi-scale factors on fatigue fractures.

Auburn ISE
student studying
in Germany.



For industrial and systems engineering senior Ian Campbell, being an Auburn student doesn't just include life on The Plains, it also means learning what life is like in Germany.

As a part of the Auburn University Global Exchange Program, Campbell is studying abroad in Schweinfurt, Germany, at the Technical University of Applied Sciences from March to December of 2023. There, Campbell is enrolled in Fundamentals of

Electrical Engineering, German, Applied Project Management, and Strategic Purchasing.

As a part of the dual degree, students spend one semester studying abroad and a second semester interning for a German company.

Campbell has been studying German since seventh grade and knew the dual degree would be a perfect fit for him.

"I came to Germany to improve my German while also learning engineering in a country which is known for being one of the best in engineering," Campbell said.

Engineering exchange programs offer semester-long agreements established between the host university and the Samuel Ginn College of Engineering. The College of Engineering also hosts students from other universities, forming an educational bond between the universities.



IISE professor joins team for international maritime project in Chile

Alice Smith, the Joe W. Forehand/Accenture Distinguished Professor of the Auburn University Department of Industrial and Systems Engineering, is a foreign collaborator for a maritime research group called the Next Generation Digital Ports project funded by CONICYT, a Chilean government agency responsible for coordinating, promoting and aiding scientific research.

The project, an initiative proposed by The National Agency for Research and Development, ANID, aims to form a scientific research network with researchers and students from across Chile, as well as international researchers to find solutions for the challenges in maritime ports. The research will include infrastructure and capacity analysis, resilience and agility, as well as logistics interoperability based on digital transformation.

This project is working to advance port design and operation, which is crucial to the global supply chain. Smith will share her experiences working on container handling operations at

empty container depots in Chile.

“This will be accomplished by international networks between North America, South America, and Europe with academics specializing in logistics and ports,” Smith said. “We are also working with the port personnel – the executives, managers, technical specialists, and government regulators.



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