College of Engineering
UNIVERSITY OF WISCONSIN–MADISON

FALL 2026 NEWSLETTER

DEPARTMENT OF

INDUSTRIAL AND SYSTEMS ENGINEERING













Greetings from Madison!

Our campus is filled with energy, optimism and a renewed sense of purpose. It is an exciting time for the UW-Madison Industrial and Systems Engineering (ISyE) community, and I am pleased to share several updates that reflect the continued strength and momentum of our department.

Our undergraduate enrollment grew by nearly 7% this fall, continuing a multiyear trend of rising interest in ISyE. Students are drawn to our nationally recognized programs and the wide range of opportunities across industrial AI, optimization, human factors, health systems and advanced manufacturing. Our graduate programs remain equally robust: This fall, we welcomed 16 new PhD students—one of our largest incoming cohorts in recent years.

Research excellence continues to be a defining strength of our department. Our faculty has secured nearly $6 million in new research grants for the upcoming year from the National Science Foundation, the National Institutes of Health, the Department of Energy, and other key federal and industry sponsors. This funding empowers our faculty and graduate students to advance work that improves manufacturing systems, strengthens healthcare delivery, enhances public safety and informs decision-making in complex environments. Their scholarship continuously elevates our national reputation and reinforces ISyE's role as a leader in shaping the future of the field.

Our department's sustained momentum is anchored by the excellence of our early career faculty. Demonstrating this national recognition, Assistant Professor Carla Michini and Associate Professor Hantang Qin earned prestigious NSF CAREER Awards this year. Expanding our research impact further, we welcome two outstanding new colleagues: Tianjiao Li (spending this year at IBM Research as a Herman Goldstine Memorial Postdoctoral Fellow), whose research spans data science, AI and algorithmic theory, and Assistant Professor Shuo Sun, who specializes in data-driven decision-making in retail operations and supply chain management. Their combined expertise elevates our academic community and strengthens our curriculum.

Our alumni community continues to play an essential role in supporting our students and strengthening our programs. Alumni serve as mentors, guest speakers, project reviewers and supporters of scholarships and student initiatives, and their engagement enriches the educational experience and reinforces the strong sense of community that defines ISyE.

Thank you for your continued support of our department. We look forward to another year of growth, discovery and impact.

On, Wisconsin!

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Mathematical modeling maps out solutions for placing drug collection boxes

A plastic bottle of prescribed painkillers—extras from a surgical recuperation—lurks in the back of your medicine cabinet. If you're like most Americans, you'll either let the pills linger, flush them down the toilet or toss the bottle in the garbage. But each of those options carries risk. Improper disposal can cause environmental issues, while forgotten pills can be a source of prescription drug abuse.

A network of U.S. Drug Enforcement Administration-registered collection boxes provides a secure disposal option, but chances are you don't know the closest location off the top of your head. Especially if you live in a rural area.

A team of optimization researchers from ISyE and the Florida A&M-Florida State University College of Engineering examined ways to more strategically locate collection boxes and improve access. The group published the results of its mathematical modeling efforts in a paper in the journal Optimization and Engineering.

"Everyone would like to benefit from this kind of infrastructure," says Monica Rico, a PhD student in ISyE. "If they're not being used, that's wasted opportunity and money."

Currently, collection boxes are located in a largely ad hoc manner, leaving "deserts"—disproportionately in rural areas, notes Rico.

"Research also suggests rural communities need these boxes the most, because they suffer more from that overprescription of opioids," says Rico, a Los Angeles native who's in her fourth year in Professor Laura Albert's lab.

Rico, Albert and alumna Veronica White (MS '19, PhD '24), now an assistant professor at the FAMU-FSU College of Engineering, built and analyzed variants of a mathematical model designed to strategically locate collection boxes. Their base model maximized coverage by ensuring a collection box within a 15-minute drive of a given location, but they also tweaked the model to offer locations other than police stations (which can be an intimidating location, deterring users), and to operate within a given financial budget.

Naturally, the researchers used Wisconsin as a case study, finding that adding 170 boxes statewide could eliminate all deserts. If building a network of collection boxes from scratch, they could sufficiently cover the state with about 80 fewer boxes than the current statewide total.

The project is an outgrowth of work that Albert and White have done using modeling to evaluate substance-use disorder treatment programs in the context of the opioid crisis.

Rico and Albert hope it can offer a roadmap for policymakers when devising public health initiatives.

"Making collection box decisions strategically is key to making a difference," says Albert. "When collection boxes are sited using mathematical models and data instead of an ad hoc process based on guesswork, there are fewer deserts and more people are served. Strategy turns good intentions into real impact."

PhD student Monica Rico's work centers around using operations research to inform public policy. Photo: Joel Hallberg.



FOCUS ON NEW FACULTY

Shuo Sun boosts decision-making in retail and supply chains

In August 2019, on the recommendation of a few faculty members from her home institution, Tsinghua University, Shuo Sun arrived in Madison. A fourth-year industrial engineering undergraduate, she came to the United States as part of an exchange program between UW-Madison and Tsinghua, one of China's top-rated universities, to experience one semester of an American education.

"It was very beautiful. I could see the lake. That was my first impression of the U.S.," Sun recalls. "And the campus was very peaceful and very beautiful."

That fall semester in Madison proved to be crucial in shaping Sun's path: It pulled her further into operations research, inspired her to return stateside to pursue her PhD, and left a warm impression that lingered when she hit the academic job market.

Seven years after she first set foot in Madison, Sun has returned to ISyE as an assistant professor. She studies modeling and algorithmic design for decision-making in retail operations and supply chain management, leveraging optimization, machine learning and other data science methods.

"I like to think of problems that come from real-world life," she says. "It should be grounded in practice, but I hope it can be generalized. I like this combination."

Sun earned her PhD from the University of California, Berkeley, interning with the e-commerce team at Amazon during summer 2024 and also collaborating with JD.com, China's largest retailer by revenue. As online shopping habits change, incorporating systems such as artificial intelligence-powered agents, she's keen to build new models to make those systems work more efficiently. The applications extend well beyond retail: Sun envisions her work contributing to supply chains of all types and, more broadly, to decision-making systems.

"I want to improve the efficiency of operations in real life by developing rigorous methodologies. For some problems, I'm very excited to explore the theoretical properties behind the problem and draw inspiration for algorithm design," she says. "There are opportunities to improve existing solutions and the overall efficiency of decision-making systems, while AI also brings new problems in different scenarios."

During her semester in Madison in fall 2019, she took ISyE 525: Linear Optimization with Professor Alberto Del Pia. The challenging but mathematically beautiful course deepened her interest in operations research.

"That's my favorite theory course during my whole undergraduate study," she says. During that semester, she also took core ISyE courses in simulation, healthcare systems and machine learning, all of which further sparked her interest in pursuing advanced study in the field.

As an undergraduate at UW-Madison, Sun also enjoyed working with her classmates on group projects, trying different types of food on State Street, discovering her love of musicals after seeing Hamilton at Madison's Overture Center, and seeing snow that reminded her of home in central China.

Now, she's excited to be back in Madison and to begin building out her lab and working with students.

"Now that I'm back, I want to give what I've learned back to the next generation of students," she says. "And I want to teach students how to use new methodologies from machine learning, data analytics and even generative AI to solve complex problems in real life."



On Friday, April 24, 2026, ISyE hosted its first-ever "Shark Tank – ISyE Edition."

The event served as a dynamic milestone for seniors in the capstone design course. After spending the semester engineering solutions for complex, real-world industry challenges, students were asked to step away from their technical spreadsheets and step into the spotlight. Their mission? Persuade a panel of "Sharks" that their solutions were worth the investment.

Three distinguished alumni brought their industry expertise to the judging panel: Jake Birrenkott (Isthmus Engineering & Manufacturing Co-op), Shannan Vlieger (Douglas Dynamics) and Mindy Rapp (Standard Iron).

Each team had just five minutes to deliver an executive summary focusing on the bottom line: financial implications and project feasibility. The pressure didn't end with the pitch, as teams faced a rigorous Q&A session from the judges, mimicking the real-world scrutiny of executive decision-makers.

While every team demonstrated the analytical rigor ISyE is known for, one group stood out for their exceptional delivery and persuasive strategy. Congratulations to our inaugural Shark Tank winners: Owen Bush, Patrick Grunklee, Mason Reitmeier and Nathan Geiger, whose project optimized the service model for a local EMS department.

Events like these bridge the gap between classroom theory and professional practice, ensuring graduates are not just great engineers, but influential leaders.

Students and instructor Sinan Tas pose with alumni judges Mindy Rapp, Jake Birrenkott and Shannan Vlieger. Photo: Jane Feller.

Fu receives Grainger Wisconsin Distinguished Graduate Fellowship

PhD student Ying Fu has received a 2026–27 Grainger Wisconsin Distinguished Graduate Fellowship, an honor for superb doctoral students in the college.

Fu's research focuses on degradation-aware learning and optimization for smart and connected manufacturing systems, where unexpected failures can cause significant economic losses and safety risks. As part of Grainger STAR Professor Kaibo Liu's research group, Fu leverages Internet-of-Things sensor data to develop methods for degradation modeling, prognostics and decision-making that improve the safety and efficiency of these systems, such as aircraft engines.

During her time as a PhD student, she has published several papers in top journals in the field, including *IISE Transactions*, *IEEE Transactions on Automation Science and Engineering*, *European Journal of Operational Research* and *IEEE Transactions on Knowledge and Data Engineering*.

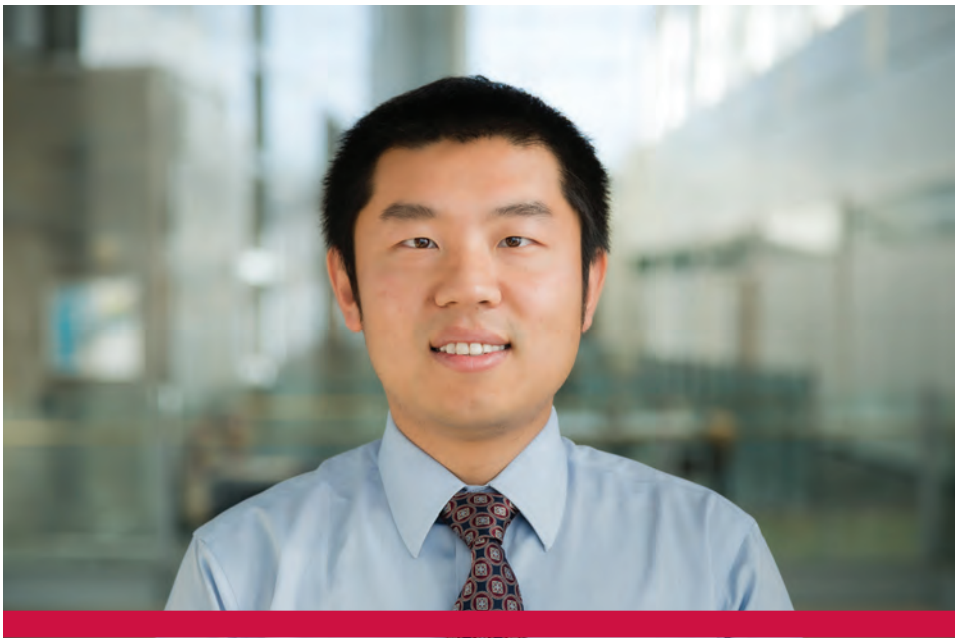
The Institute of Industrial and Systems Engineers named her a 2025-26 Future Faculty Fellow. She has served as a teaching assistant for ISyE/ME 412: Fundamentals of Industrial Data Analytics, earning stellar student reviews.

In addition to pursuing her PhD, she earned a master's degree in computer science from UW-Madison in 2025. Before arriving in Madison in 2022, she earned her BS in engineering and finance and MS in management science and engineering from South China University of Technology in Guangzhou, China.

"Ying is an exceptionally talented, highly motivated and forward-looking PhD student whose record of research excellence, productivity, teaching and professional preparation exemplifies the goals of the Grainger Wisconsin Distinguished Graduate Fellowship," wrote David H. Gustafson Department Chair Shiyu Zhou in his nomination letter.



Submitted photo



With NSF CAREER Award, Qin plans to take quantum manufacturing to space

In addition to working on NASA-funded research, Associate Professor Hantang Qin is raising a space-exploration enthusiast. His 8-year-old son, George, eagerly watched the launch of the Artemis II mission in April 2026, fresh on the heels of a visit to the UW-Madison Space Place.

During that outing to the astronomy department's public education center on Madison's south side, Qin watched George try out a diffraction-grating kaleidoscope, which splits light into its component wavelengths (aka, colors). And it struck Qin that he was seeing his son glimpse the principle behind one of the core components of his latest research endeavor.

Qin has received a five-year, $550,000 National Science Foundation CAREER Award to build a new type of laser-assisted hybrid nanomanufacturing system that will feature a laser-diffraction-enabled quality monitoring system. Qin's aim is to create a system that, once scaled up, could reliably produce qubit arrays needed for quantum computing—all while operating in space, away from the influence of gravity.

"It's hard to make arrays at this moment because each small unit is already too hard to make," says Qin. "Making units into arrays is a huge challenge. So, if we can control the quality of each pillar inside of the array, it will improve the efficiency of prototyping quantum devices."

Qin's research has centered around electrohydrodynamic inkjet printing, an alternative form of 3D printing technology that employs electrical force rather than gravity to extrude inks at the micro- and nanoscales. That's especially important for his work on in-space manufacturing of electronic components, which his lab has tested in zero gravity several times.

In this project, Qin will combine the printing process with a laser-sintering treatment that removes excess polymers and enhances 3D patterning to improve the components' electrical performance.

"We're looking into how the physics will change—given the two processes are now merged into one step—and how the quality can be evaluated," says Qin.

Enter laser diffraction, which will allow Qin's team to glean insights that would elude visual detection using traditional methods.

"Even using a microscope at the nanoscale, the resolution is too small to be recognized," he says. "In this case, we shoot a laser at this nanojet. The laser will be diffracted, and it will be large patterns that we can analyze and try to calculate what's going on with the nanojet. By doing this, we will have a manufacturing system. We will have a quality control system. Together, we can make better quantum devices."

And space, it turns out, could be an ideal setting for qubit manufacturing. "A lot of the time when we make the nanostructures, they collapse," Qin says. "But under zero gravity, there will be no gravity to collapse them."

Thus, not only could future qubit arrays and microelectronic devices be printed and then deployed to support space missions, repair satellites and more, but they also could be printed in the friendlier confines of zero gravity and then shipped down to earth. Qin also sees opportunities to eventually expand the scope of the work to biomedical applications, such as lab-on-a-chip devices.

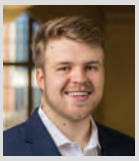
For the educational component of his CAREER Award, Qin plans to create a virtual-reality-based teaching platform, which will enable hands-on learning away from well-stocked research labs and testing facilities.

"I value workforce development quite a lot," he says.

FACULTY NEWS



Keith and Jane Morgan Nosbusch Professor and Vilas Distinguished Achievement Professor Laura Albert received a 2026–27 Kellett Fellowship, an award named for William R. Kellett that recognizes faculty who have made key research contributions in their fields. Albert was also named the college's inaugural senior associate dean for faculty affairs and development.



Assistant Professor Michael Biehler will serve as the sole principal investigator on a $600,000 Office of Naval Research grant to develop self activating shielding systems that protect electronic systems from electromagnetic threats.



Harvey D. Spangler Professor Jeffrey Linderoth received a new grant from the Office of Naval Research to develop automated decision tools that support national security and operational readiness at U.S. Navy maritime operations centers.



Grainger Institute for Engineering Professor Ranjana Mehta will serve as interim director of the college's Grainger Institute for Engineering.



Assistant Professor Carla Michini has been appointed to the Thomas Werner Assistant Professorship in ISyE. Established through a generous gift from Tom and Suzanne Werner, with Tom being an ISyE alum from 1982, this is the department's first assistant professorship.



Associate Professor Hantang Qin received a Wisconsin Impact Nexus grant through the Grainger Institute for Engineering to establish an advanced manufacturing and production center, partnering with local companies and national manufacturing hubs to advance AI-enabled advanced manufacturing for space and aerospace.



Professor Emeritus Robert Radwin was elected to the 2025 class of fellows of the American Association for the Advancement of Science.

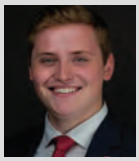


Associate Teaching Professor Amanda Smith was named director of the college's Center for Innovation in Engineering Education.

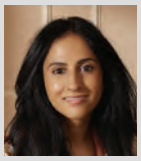
ALUMNI NEWS



Raed Kontar received the 2026 John Agapiou Outstanding Young Manufacturing Engineer Award from SME, an honor recognizing manufacturing engineers aged 35 or younger whose technical achievements and leadership are advancing the field.



Reid Parks received the sixth Ogden (Ted) Brown and Hal W. Hendrick Young Investigator Award at the 15th Annual Symposium on Human Factors/Ergonomics in Organization Design and Management, recognizing his contributions to implementation science, human factors and healthcare improvement.



Michelle Ranavat continues to change the world of beauty. She's been named a finalist for the Breakthrough Track in the Business of Beauty Global Awards 2026.



Nadeem Sheikh, a member of the department's industrial advisory board, has been appointed chief business officer at Terawatt, the nation's leading full stack charging infrastructure platform for autonomous and electric fleets. In this role, he will lead business development, partnerships and marketing.

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What were they thinking? Study looks inside the minds of AV drivers who grabbed the wheel

In collaboration with Grainger Institute for Engineering Professor Ranjana Mehta and Associate Professor Tony McDonald, Yinsu Zhang (PhD '26) probed the neuroscience of trust—and distrust—around human takeovers of automated vehicles, identifying the relevant brain activation patterns. The ISyE trio detailed its work in a paper in the journal *Association for Computing Machinery Transactions on Human-Robot Interaction*.

While automated features continue to roll out, instances of misuse have been cited in deadly crashes.

"These kinds of systems require constant human monitoring, but people aren't doing that," says Zhang. "So that's when things go wrong and crashes happen."

On the flip side, others are wary of turning over driving control to automation. Clearly, trust plays a central role in public acceptance. But the gold standard of trust assessment has long been surveys, which don't allow for real-time monitoring or reveal the neural signatures at play.

The trio analyzed drivers during simulated events involving a vehicle's automated crash avoidance and similar capabilities. In particular, the researchers explored the impact of "proactive takeovers"—where drivers opted for manual control—on drivers' trust by examining eye-tracking gaze measurements and neural activation using functional near-infrared spectroscopy in addition to verbal surveys.

Unsurprisingly, drivers who proactively took over control of the vehicle reported lower trust ratings. They also showed great gaze fixation on the AV disengagement control and suppressed activation across four brain regions. Mehta says the study demonstrates the importance of observing end-users' natural behaviors in realistic scenarios.

While the researchers couldn't predict driver decisions based on their neural and gaze data, they plan to continue to pursue that question in future work. Photo: Joel Hallberg.