# *Industrial & Systems Engineering*

The Department of Industrial & Systems Engineering is proud to commemorate 100 years of industrial engineering at Mizzou. Our curriculum initially focused on factory organization, production and labor supply. Today, we build on this foundation by preparing students for modern industries, including emerging transportation logistics, data analytics for decision-making, human-computer interaction, supply chain logistics, and advanced manufacturing.

In addition to the work you'll read in this report, our department is preparing to launch an Industry 4.0 certificate programs for undergraduate students. We're also partnering with the MU Career Accelerator to bring another version of this program to working Missourians and industry professionals. We're excited for the future of these programs and are proud to support the land-grant mission of the University of Missouri.

Thank you for taking the time to learn more about Industrial & Systems Engineering at Mizzou.

*Scan to learn more!*

*James Noble*
*Chair, Professor*
*Industrial and Systems Engineering*

WELCOME TO MIZZOU ENGINEERING

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Step inside Mizzou Engineering with our 360° virtual tour of our classrooms, labs and student spaces. Learn about our degrees, extracurricular opportunities and support resources from the comfort of your home.

# Show Me
## THE NUMBERS

**People in ISE** - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - ●

# 130 Undergraduate Students

## 80 Graduate Students

## 10 Faculty Members

**Research Expenditures** - - - - - - - - - - - - - - - - - - - - - - - - - - - - - ●

# $1,578,560 in FY24

# ↑255% Increase in research expenditures from FY23 to FY24

*Funding Sources: NSF, DoD, DoE, DoEd, FHWA, EDA, state DOTs and industry.*

**Research Areas** - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - ●

Advanced Manufacturing

**Healthcare Systems**

**Applied Operations Research**

Human-Computer Interaction

Data Analytics for Decision Making

**Quality & Reliability Engineering**

**Emerging Transportation Logistics**

Supply Chain, Logistics, Material Flow

# Tier I Research Institution • AAU Member

$2M for new advanced manufacturing & industry 4.0 labs

$125K for new undergraduate labs with mobile robots, drones & augmented reality equipment

# Research
## HIGHLIGHTS



**Sharan Srinivas** secured an NSF Partnerships for Innovation – Technology Translation (NSF PFI-TT) grant aimed at optimizing the use of unmanned aerial vehicles and electric trucks to address the pressing challenges of efficiency and sustainability.
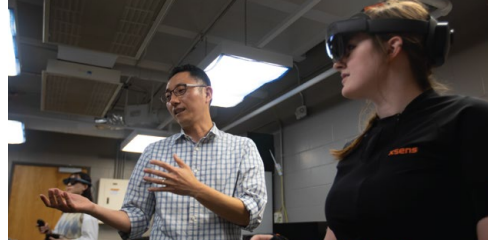


**Jung Hyup Kim** is exploring how metacognition directly relates to performance and workload for his ongoing investigation into best practices using augmented reality for engineering education. His work has funding from the National Science Foundation.
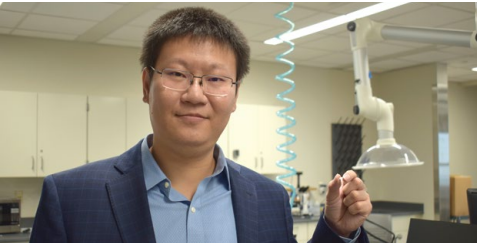


**Yi Wang** and collaborators are developing a new type of neural probe that can improve basic understanding of brain circuits and ultimately lead to better treatments for neurological diseases. The team received a three-year grant from the National Science Foundation.
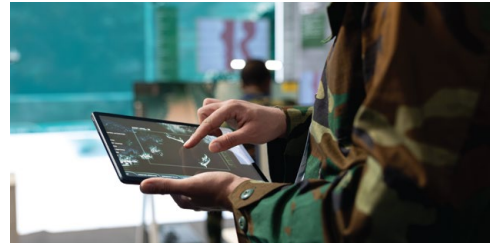


**James Noble** is contributing to a groundbreaking project that aims to help the U.S. Army make more timely and strategic decisions in today's technology-driven defense landscape. It is part of a subcontract from the University of Houston's award with the U.S. Department of Defense.



**Sharan Srinivas** received funding from the Alaska Department of Transportation to work with the Port of Alaska and its stakeholders to assess freight and fuel truck operations. They will develop an interactive digital communication portal for improving visibility into port operations.
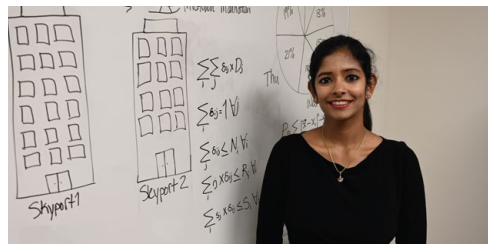


**Suchi Rajendran** is using prescriptive analytics, a powerful form of artificial intelligence (AI) that recommends specific actions based on predictions, to help researchers plan for air taxis in major U.S. cities. Her work is funded by a NSF IRES grant.

# Student
## SUCCESS



**Erin Hyde** conducted a manufacturing and engineering associate internship at General Mills. She spent her time at the Hannibal, Missouri, plant working on continuous improvement trials and training materials.



**Mariam Morafa** was a supply chain intern at HP this past summer and supported the documentation of their procurement process and created a new product-tracking database.



For their senior capstone, **Adam Heskett, Connor Larkin** and **Will Norris** proposed improvements to the small press shop at Caterpillar Booneville. Their recommendations included removing unnecessary items to redesign areas to create a safer and more efficient work area, adding a platform to the loading/unloading press and switching to a manual laser sensor.



A capstone group of **Natalie Barber, Nick Hummert** and **Matthew Reynolds** worked with Scholastic. The group aimed to improve job setup for workers in hopes of reducing the composite lifting index (CLI) to less than one, finding opportunities for buffer increases and increasing the capacity of upstream processes by 5%.



A **team of industrial engineering students** placed third at the 2023 Project MFG SEC Machining Competition. The group was challenged to design a single cylinder pneumatic engine then make three components: the piston block, engine base and flywheel.



Mizzou hosted the National Science Foundation Research Experiences for Undergraduates Site (NSF REUs) "Research on Prescriptive Analytics for AI-enabled Operations Engineering," led by **Suchi Rajendran**. REUs help students conduct authentic research, receive mentoring, build knowledge and research skills and learn about career pathways in STEM.

# ISE
## ACCOLADES



**Ray Wood** placed third in the IISE Global Undergraduate Student Technical Paper Competition and the IISE Operations Research Undergraduate Research Competition at an international competition held in Montreal, Canada.



**Madeline Easley** placed first in the Department of Industrial and Systems Engineering Undergraduate Research Competition for research into the effectiveness of augmented reality (AR) in classrooms. She then went to present at the HCII Conference in Washington, D.C.



**Pyam Oveys** won first place at the 2024 Center for Excellence in Logistics and Distribution (CELDi– a graduated NSF-I/UCRC) Annual Meeting and Research Symposium. Oveys, was part of a team that included faculty members and fellow PhD students, presented research which focused on developing an artificial intelligence-based tool to enable faster and smarter steel purchasing decisions.

# Alumni
## SPOTLIGHT

The Industrial and Systems Engineering Hall of Fame inducted eight new members in November. The 2024 inductees are: **Emily Dierberg** (BS '04), **David S. Kim** (BS '04), **Nick McLean** (BS '03), **Amit Midha** (MS '95), **Craig Reynolds** (BS '93), **David Schnedler** (BS '72), **Zim Schwartze** (BS '89) and **Teresa Zayas Cabán** (BS '01).

Alumnus **Brian Whorley** (BS '03), founded Paytient six years ago to improve the ability of people to self-pay for health care, making care more accessible and affordable for more people.

**Jeff Haferkamp** (BS '76) was honored with a James E. "Bud" Moulder Distinguished Alumni Award at Mizzou Engineering's 2024 Awards Banquet.