IOWA STATE UNIVERSITY

Department of Industrial and Manufacturing Systems Engineering

INSE News 2022-2023



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Cover Image:

Photorealistic rendering of the future Advanced Manufacturing Lab inside the Therkildsen Industrial Engineering Building

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Message from the Chair

Dear Friends and Alumni,

Spring is in the air! There are many exciting changes taking place within our department and nearby on the west side of campus.

Construction is officially underway on our new industrial engineering building, and now that much of the underground piping and basement foundation work is complete, we are starting to see some "aboveground" structural progress being made. This state-of-the-art facility will offer the College of Engineering many opportunities for collaboration with government and industry, expand our graduate student offerings, and provide an outstanding venue to host alumni and department events. And, our primary donors, the Therkildsens, were the recipients of this year's Order of the Knoll Campanile Award – the highest honor the ISU Foundation bestows upon donors.

This issue also includes stories about the accomplishments of our students and alumni as well as some great research projects and other initiatives led by our faculty within the last year. Our students continue to win numerous awards, as do our faculty. Especially of note is that Dr. Cameron MacKenzie, whose research focuses on decision and risk analysis, is now tenured and promoted to the rank of associate professor. He has proven to be a staple in our department and this is a well-deserved recognition of his hard work.

We're looking forward to some new faculty additions for the fall term, including Dr. Jundi Liu, who specializes in human factors and ergonomics research, as well as Dr. Bin Li and Dr. Jakob Hamilton, whose research will focus on advanced manufacturing. You can read more about them on page 9.

The future is looking bright for the Department of Industrial and Manufacturing Systems Engineering here at Iowa State! Our department's accomplishments would not be possible without the support from our students (and their families), faculty, staff, alumni, donors and other stakeholders. I hope you enjoy reading more about our latest achievements and are able to see the impact our department is having not only on campus, but across Iowa and beyond.

Go Cyclones!

Para mpy

Sarah Ryan C.G. "Turk" and Joyce A. Therkildsen Department Chair and Professor



Therkildsen Building Update

Construction is underway!

Construction has officially begun on the Therkildsen Industrial Engineering Building, which will be the stand-alone home for Iowa State's Department of Industrial and Manufacturing Systems Engineering when completed in November 2024 (planned).

The building is named in honor of C.G. "Turk" Therkildsen and Joyce McEwen Therkildsen, Class of 1959. Turk studied industrial engineering and went on to become CEO of Industrial Hard Chrome, while Joyce majored in zoology and physical education, working as a teacher and coach before becoming a Corporate Secretary for Industrial Hard Chrome.

Since 1999, the Department of Industrial and Manufacturing Systems Engineering (IMSE) has shared space and other resources in the Black Engineering Building with our colleagues in the mechanical engineering department. As the IMSE department has grown over the past quarter century, with fewer than 200 students in 1999 to more than 450 today, so has the need for a stand-alone building. Department faculty, staff and students have worked with designers to ensure the research, learning, and collaboration spaces are developed with the specific needs of the department in mind. This will enable the department to provide resources tailored to our needs and the pillars of our land grant mission: helping to prepare our students for the careers of tomorrow, enabling our faculty to conduct impactful research, and contributing to lowa State's culture of innovation.

Project Contractors: Story Construction and BNIM

Size: Four levels and 80,000 gross square feet

Featured Spaces: Auditorium, Learning Community and Collaboration Areas, Advanced Manufacturing Lab, Computer Labs, Capstone and Graduate Work Rooms, Immersive Presence Lab, ITAR Lab

Expected Occupancy: Early Spring 2025



"Iowa State gave Joyce and me a great start in life. Sixty-six years ago, it brought us together, and our degrees equipped us with untold confidence and determination. The IE building is our thank you to Iowa State."

C.G. "Turk" Therkildsen, whose \$42 million lead gift for the new facility is the largest gift for an academic building in lowa State University history

Construction timeline

May 2023

The elevator pit is getting backfilled and construction on the steam vault has begun. Formwork for the basement footings and walls is installed and concrete is poured.

March 2023

Chilled water lines are installed and connected to Thielen Health Center. Excavation work for the basement footings begins, including the elevator pit, along with aggregate piers and shoring up the existing duct bank.

January 2023

Parking lot demolition begins. Perimeter fencing is also installed around the site and project trailers are set up.











September 2022

A ground-breaking ceremony is held with the guests-of-honor, the Therkildsens.

(Pictured L to R: Landon Getting, industrial engineering graduate student; Larissa Holtmyer Jones, President and CEO, Iowa State University Foundation; Wendy Wintersteen, President, Iowa State University; Joyce A. McEwen Therkildsen, '59 Zoology and Physical Education; C.G. "Turk" A. Therkildsen, '59 Industrial Engineering; Sarah Ryan, C.G. "Turk" and Joyce A. Therkildsen Department Chair; W. Samuel Easterling, James L. and Katherine S. Melsa Dean of the College of Engineering.)



For all the latest building updates, visit imse.iastate.edu/therkildsen



Outstanding Seniors

Blake Clark: Fall 2022 Outstanding Senior in Industrial Engineering



Valuable hands-on learning experience: In my summer internship with Chevron-Renewable Energy Group, I was able to experience elements of both a small company and a major corporation as REG underwent an acquisition by Chevron. The internship also provided fantastic experience in the clean energy sector and allowed me to use the skills I have learned in the College of Engineering while sharpening a number of other critical professional skills as well.

Influential mentors: I had two influential mentors during my time at Iowa State: Leslie Potter, teaching professor of industrial and manufacturing systems engineering, and head Cyclone football coach Matt Campbell.

Plans after graduation: I will begin working part-time at Chevron-Renewable Energy Group as a student associate while I finish up my master's work before joining full-time in May.

"As engineers, I think we have the unique opportunity to innovate to make people's lives safer and more comfortable. I plan on solving problems, those identified and yet to be identified, in our world to make it a better place."

Kylie Mathison: Spring 2023 College of Engineering Student Marshal



Valuable hands-on learning experience: Working throughout my internships gave me the opportunity to learn and interact with people in completely new environments. I saw glimpses of every IE course taken in many aspects of my daily work life. Through these experiences, I have been able to amplify my knowledge gained in the classroom.

Influential mentors: Two of the most influential mentors are Leslie Potter, teaching professor of industrial and manufacturing systems engineering, and Michael Helwig, associate teaching professor of industrial and manufacturing systems engineering. Both of these individuals are truly committed to their students professionally and personally. Whether that be constantly pushing their students to achieve more or offering support any time of the day, they have taught me to never stop reaching for goals.

Plans after graduation: I will be working for Deloitte as a business technology analyst.

"I have learned the importance of creating and improving systems to better sustain the future and hope to use this knowledge to drive innovation into the workplace everywhere I go."

Faculty Highlights

Danial Davarnia wins Young Investigator Program Award

Danial Davarnia, assistant professor in the department of industrial and manufacturing systems engineering, has been selected for the 2023 Young Investigator Program Award by the Air Force Office of Scientific Research (AFOSR).

His research focuses on developing new methods to solve industrial problems with a variety of engineering techniques, including convexification, network analysis, function approximation, and machine learning.

Using the concept of "decision diagrams," Davarnia is able to compactly represent the underlying optimization problem as a network model. This graphical approach has several advantages over the standard algebraic-based solution methods, including increased modeling flexibility and providing more information about the data structure of the problem. He can then apply these models to an array of industrial applications – from energy systems to transportation – which can lead to solving optimization challenges more efficiently.



"Given the competitiveness of this award, I am very pleased that my research has received such a great recognition and been deemed transformative in the field of mathematical optimization."



Cameron MacKenzie receives tenure and promotion to rank of Associate Professor

"**Dr. MacKenzie** is a recognized expert on decision and risk analysis with application in natural disasters, supply chain risk, and engineering design and manufacturing," said IMSE chair, Dr. Sarah Ryan. "Recently, he led a team of faculty in obtaining funding from the Navy to develop a new undergraduate program in Navy Engineering Analytics. Several student teams have placed very high in the international Simio Student Simulation competition based on their work on his course project. He is an all-around contributor in teaching, research, and service."

Faculty Highlights

Stephen Gilbert awarded two patents related to virtual reality research

Industrial engineering associate professor, **Stephen Gilbert**, along with other researchers from Iowa State and a team of engineers from Deere and Company recently received two U.S. Patents related to their collaborative virtual reality research.

Patent 11,580,628 B2 was issued for the "apparatus and methods for augmented reality vehicle condition inspection," while US 11,587,315 B2 was given for the "apparatus and methods for augmented reality measuring of equipment."

In Memorium: Clifford Smith

Emeritus Professor **Clifford Smith** died in September 2022 at the age of 96. He proudly served in the Army Air Corp at the end of World War II before earning his BS degree in General Engineering, an MS degree in Industrial Engineering, and a Ph.D. in Engineering Evaluation in 1964, all from Iowa State College.



He joined the Industrial Engineering Department as a faculty member at Iowa State and remained there until his retirement in 1989, where he taught classes in statics, strength of materials, safety engineering, engineering problems, industrial organization, and human resource management.



Matt Frank receives Regents Award for Faculty Excellence

Matt Frank, John B. Slater Professor in Sustainable Design and Manufacturing and IMSE Professor, is the recipient of the Regents Award for Faculty Excellence.

The award, which he will be formally presented with later this fall, is given by the state Board of Regents to recognize tenured faculty members who are outstanding university citizens and have rendered significant service to the university or the state of lowa.

Matt Frank earns patent for unique manufacturing system

Matt Frank and a team of engineers from Deere and Company were recently issued U.S. Patent 11,364,536 B1 for the "layered slab manufacturing system and method" they developed.

The team developed a manufacturing method that uses 3D printed layered slabs to create a final pattern for casting tooling applications. The method includes printing a prescribed number of slabs and iteratively stacking and machining them to create complex geometry.

Dave Sly helps expand Digital Manufacturing Lab's partnerships

The Center for Industrial Research and Service (CIRAS) Digital Manufacturing Lab powered by Alliant Energy recently added two new partners, Pratum, an information security company, and ProPlanner, specialists in tools for complex assembly manufacturing.

As part of their partnership, ProPlanner moved next to the lab and integrated their workstations with lab-based equipment and devices. This gives lab visitors access to ProPlanner capabilities including bar code scanners, torque tools, and other equipment that runs the company's Manufacturing Execution System (MES). Customers rely on MES to determine the most efficient manufacturing and assembly process to create a specific unit.



"Modified products can be put into production in days, instead of weeks and months," explained **Dave Sly**, ProPlanner president and IMSE Teaching Professor. "We're excited to show lab visitors just how that's done."

New faculty and staff join the department

Faculty (starting Fall 2023)



Dr. Jakob Hamilton – Advanced Manufacturing

Education: Ph.D. in Industrial and Systems Engineering from the Rochester Institute of Technology

Research Interests: Understanding defect formation within metal powder bed fusion and directed energy deposition in aerospace industries; applying in-situ monitoring techniques and material science to increase the robustness of current AM platforms



Dr. Bin Li – Advanced Manufacturing

Education: Ph.D. in Metallurgy from the University of Connecticut Research Interests: Computation-guided advanced manufacturing of high strength steels and lightweight alloys for automotive and aerospace applications with improved energy efficiency, as well as mechanical properties of low symmetry metals and alloys



Dr. Jundi Liu – Human Factors and Ergonomics

Education: Ph.D. in Industrial and Systems Engineering from the University of Washington

Research Interests: Improving human-autonomy interaction through learning a hybrid human model that understands and adapts to human trust dynamics and captures drivers' preferences

Staff

Shelley Anderson *Administrative Assistant*

Arlys Jorgenson

Undergraduate Academic Advisor

John Luckiesh

Undergraduate Academic Advisor

Erin Mack

Communications Specialist

Jess Severe Graduate Program Coordinator

Notable Research

Gilbert and Dorneich part of ISU research team conducting cybersickness study



Like motion sickness, cybersickness can occur when there's a mismatch between visual motion and body motion. Symptoms, including nausea, dizziness, headaches and eye fatigue, usually resolve quickly after removing the headset. But in severe cases, they sometimes last for hours.

lowa State researchers in engineering and psychology found women experience cybersickness with virtual reality headsets more often than men. Their ongoing work, supported by a new \$600,000 grant from the National Science Foundation, explores why this difference exists and options to help individuals adapt. ISU professor **Michael Dorneich** and associate professor **Stephen Gilbert** in industrial and manufacturing systems engineering, along with colleagues in psychology, recently coauthored two related papers for the IEEE Virtual Reality Conference. The first paper provides an overview of existing research on gender and cybersickness, including their own findings.

As part of a larger study on adaptation to cybersickness, the ISU researchers recruited 150 participants to play up to 20 minutes of a VR game with a headset. The participants were new to VR and could stop if they felt too sick to continue. The researchers found women ended the game early twice as often as men and reported a sickness intensity that was 40% higher.

With the new NSF grant, the ISU researchers will continue to investigate the causes of cybersickness and methods to help individuals have a positive experience with VR.

This includes adding "blinders," which reduce the users' peripheral vision while they move through a space, and options to teleport from point A to point B. Both reduce cybersickness by reducing visual stimulation. The researchers will also study how these settings can be adjusted over time to help the user adapt comfortably and ease into VR.

Research at the Capitol

Industrial engineering undergrads, Olivia Poppen, Tatum Englund and Madison Bemis, were invited to present their research, "Ergonomic Assessments via Virtual Reality: Is it Possible?" at the State Capitol in March 2023.

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Researchers collaborate to develop energyefficient strategies for removing corrosion on metallic surfaces

lowa State University's **Yiliang (Leon) Liao**, associate professor of industrial engineering, and Beiwen Li, assistant professor of mechanical engineering, are teaming up with researchers from the University of Nevada, Reno and the University of Dayton to develop an energy-efficient and ecofriendly strategy for the effective removal of corrosion and coatings to remanufacture metallic surfaces. The research will be conducted over two years with more than \$880,000 in funding from the Department of Energy (DOE) and their Reducing Embodied Energy and Decreasing Emissions (RE-MADE) initiative.

The proposed hybrid laser processing technology aligns well with the objectives of the DOE REMADE program, which strives to reduce energy consumption and greenhouse gas emissions associated with the remanufacturing and reuse of products. The hybrid laser processing technology addresses the current limitations of the conventional "burning + blasting" process, which has technical barriers and high energy consumption and cost. This new method could reduce that energy consumption by more than 50% and could have a significant impact on sectors where remanufacturing and repair of metallic surfaces have widespread applications, like the automotive and aerospace industries, the military, as well as energy infrastructures.

Emeritus Professor, Steve Vardeman, coauthors textbook on statistical concepts

Steve Vardeman, longtime professor in the Department of Industrial and Manufacturing Systems Engineering, is the co-author of a newly available open-source book, Basic Engineering Data Collection and Analysis. With actual engineering data, step-by-step scenarios, and chapterlong case studies, the statistical concepts are explained in realistic, thoroughly detailed situations. Exploring how analytics can help farmers and policymakers achieve financial and environmental sustainability

In their analysis and case study for corn production, "Farm Management Optimization Under Uncertainty with Impacts on Water Quality and Economic Risk," professor and C.G. "Turk" and Joyce A. Therkildsen IMSE Department Chair, **Sarah Ryan**, and recent Ph.D. graduate, **Görkem Emirhüseyinoglu**, discuss how climate uncertainties and global market volatility can impact annual farm management decisions.

The study, published in *IISE Transactions* and featured in *ISE Magazine*, provides insights for policymakers by revealing the interaction between fertilizer management and insurance policy selection, and identifying financial incentives necessary to reduce nutrient pollution.



Student Success Stories

Cyclone engineering seniors receive first place in pitch off competition for automated medicinal sprayer product

Eugene Meyer, a senior in industrial engineering and Dakota Belling, a senior in civil engineering, placed first in the "New Idea" category of the sixth annual Pappajohn Center for Entrepreneurship college-bycollege pitch, receiving a \$5,000 award. Participants have to go through several rounds for the potential to win, and pitch their idea in 90 seconds to panels of judges.

Belling and Meyer presented their idea, an automated medicinal sprayer system for cattle, several times as they moved up in the competition. Their product idea identifies individual cattle and applies the appropriate drug, dosage, and frequency of delivery. The duo's idea has two huge impacts: reducing chemical waste and alleviating manual work by farmers.



Industrial engineering students win top spots in international Simio competition



Each semester, students in course IE 413, Stochastic Modeling, Analysis, and Simulation, are required to create a simulation project using Simio software and enter it into the bi-annual international Simio Student Simulation Competition. The fall project required students to simulate operations at a soccer stadium with 5000 fans entering the stadium, going to their seats, and going to the concession stands, merchandise booths, and bathrooms. The students must consider how to optimize critical resources and facility design to improve revenue, wait times, and overall fan satisfaction.

Out of 434 total teams that participated in the fall 2022 contest, seniors **Katie Wyatt** and **Moriah Conner** (Industrial Engineering, '23), took home second place – and were the top ranked undergraduate team. Their analysis included calculating fan traffic patterns, total items sold at the concessions, and total revenue lost due to long lines.

Another ISU team, made up of seniors **Madison Arndt**, **Vaidehee Bahirat**, and **Jolie Jacobus** (Industrial Engineering, '23), received an honorable mention, placing them in the top eight.

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Safety (and innovation) first: IE student, Sarah Ng, co-creates device to keep construction workers on the job

Forget to click your seatbelt and your car will issue a polite reminder to buckle up. For some, that dinging prompt is annoying. For innovative Iowa State students **Sarah Ng**, a senior in industrial engineering, and Phillip Gorni, a senior in civil engineering, it's inspiring.

With that seatbelt warning in mind, they developed a safetyfocused project that won first place – along with \$10,000 in early-stage seed funding – in the 2022 Student Innovation Fund Challenge, one of the several competitions in the university's innovation ecosystem. Mutually interested in construction worker safety, Sarah and Phillip developed a pitch for a system that uses computer vision technology to detect whether workers are wearing required safety equipment. For example, should a construction worker forget their hard hat, Ng and Gorni's system would detect the oversight and send a reminder – like that seatbelt warning ding – delivered through a phone app or a nearby device.

The project, called Safety Scan, could reduce workplace injury and associated costs. Sarah and Phillip will use their seed funding to acquire the technical support to develop a "minimum viable product" – essentially, an early prototype. They'll present their progress at next year's challenge, which could result in more support.



"The culture of innovation has really made my lowa State career," Sarah says. "I've pushed myself in ways that I would never have imagined."

Industrial engineering alum, Carl Kirpes, featured in ISE Magazine



Carl Kirpes (industrial engineering B.S. '12, M.Eng. '14, Ph.D. '22) was featured in *ISE Magazine's* November 2022 issue with an editorial, called Bring the Purpose. In the piece, he offers his thoughts on servant leadership and the role leaders play in cultivating a positive work environment.

"The culture the leader develops is often paramount to the organization's success – even more so than the organization's strategy – and creates a work environment that makes the company or organization a strangely attractive, even compelling place for people to work."

Community and Outreach

Iowa Wild STEM Event

The lowa Wild hosted a STEM day in April 2023 where middle schoolers got to learn about industrial engineering concepts from IMSE faculty, including Rick Stone, Cameron MacKenzie, and Leslie Potter, participate in hands-on activities, and meet the Wild's mascot, Crash.



State Science and Technology Fair

The Iowa 4-H Youth Development's State Science + Technology Fair of Iowa (SSTFI) was held at Hilton Coliseum in March 2023. Participants displayed their projects, talked about their findings and processes, and met with professional researchers. They also came over for a tour of the Black Engineering Building and took part in some fun demonstrations. Five IMSE scholarships were awarded to students with outstanding projects.



Experience Iowa State Days

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Prospective students had opportunities to talk to industrial engineering students and faculty, attend various interest sessions, and tour areas of campus.





Graduate students and faculty got together for some bowling fun (March 2023)



Celebrating the end of Ramadan with a pizza party (April 2023)





The IMSE faculty and staff team up for the IDEAL Learning Community Volleyball Tournament (March 2023)

Senior Design Showcase

Fall 2022 IE 441 Capstone Projects

Alyssa Bowes, Grayson Burgess, Paul Crandall, Gayle Yii (First Place Winners)

Rada Manufacturing (Waverly, Iowa) "Material Handling and Inventory Improvements"

Gloria Almendarez, Yajaira Navarro, Dalton Teeter

Danfoss (Ames, Iowa) "M46/MPI Assembly Line Capacity and Layout"

Vandi Hartanto, Jacob Kauk, Joseph Putman, Henry Roback

John Deere (Moline, Illinois) "Optimizing Process Control and Flow"

Patrick Bess, Matthew Booth, Blake Clark, Sean Gardner

General Grind (Aledo, Iowa) "Reducing Defect Rates on Three Machines"

Izak Baumhover, Alexander Moses, Logan Walsh, Drew Westercamp

Helena Industries (Des Moines, Iowa) "Decongest Material Flow Areas and Improve Safety"

Nicole Aroche, Luke Becker, Guillermo Iraheta, Emily Nejdl

Kings Material, Inc. (Cedar Rapids, Iowa) "Reducing Inventory and Improving Yard Capacity"

Samuel Austin, Makayda Johnson, Eugene Meyer, Shalin Patel

Pella Corp. (Pella, Iowa) "Decreasing Gantry Crane Dependency and Improving Inventory Efficiency"

Ben Cahalan, Matt Hines, Joseph Ryan, Daniel Swegle

Snap-On (Algona, Iowa) "Level 5 Control System Line Balance"

Erik Rutzen, Alexander Kock, Jagaruk Bhatt, Jordan Green

United Equipment Accessories (Waverly, Iowa) "Improving Training Program Efficiency"

Max Cajthaml, Zach Ford, Mike Freda, Drew Varys Zinpro (Garner, Iowa) "Dryer Optimization"





Spring 2023 IE 441 Capstone Projects

Mason Ekblad, Isaac Grindinger, Tony Lane,

Brady North (First Place Winners) General Grind (Aledo, Iowa) "Improving Cost of Quality (CoQ) Calculations"

Cale Nelson, Charles Byrd, Max McFadden, Pat Miller

All States Ag (Lake Mills, Iowa) "Improving Receiving, Picking, and Shipping Processes"

Kevin Tebbe, Joe Caleo, Devon Valle, Justin Dabulskis

B&G Foods (Ankeny, Iowa) "Replacement Plan for Bottle Depalletizer"

Lasota Rachel, Sierra Kostinec, Emily Oldham, Maribel Gonzalez

Danfoss (Ames, Iowa) "Reducing Process Bottlenecks"

Issac Bernard, Daniela Zeldon, Tyler Brenza, Alau Wauy

John Deere (Moline, Illinois) "Integrating a New Product into Large Planter Assembly Line"

Kegan Wall, Lee Nelson, Riley Gora, Ben Marburger

DeeZee (Ankeny, Iowa) "Controlling Applied Material Waste to Reduce Process Cost"

Ryan Zgonena, Mason Corpolango, Nathan Wetzel, Chase Cagle

Kings Material (Hiawatha, Iowa) "Increasing Production Through-Put of Wet-Cast Products"

Peter Fucigna, Charles Roth

KT Pacer (Cedar Rapids, Iowa) "Improving Layout and Processes of Shipping and Receiving"

Vai Bahirat, Moriah Connor, Laura Lynch, Katie Wyatt

Mary Greeley Medical Center (Ames, Iowa) "Identifying Reasons for 1:1s and Exploring Alternatives"

Hector Rivera, Maggi Braun, Alexis Ashton, Lance Barmann

Pella Corp. (Pella, Iowa) "Defining the Floor Space Impact and Cost of Using a New Style of Fork Truck"

Adam Bohn, Aden Harzman, Grace Peterson

Rada Manufacturing (Waverly, Iowa) "Measuring Material Handling and Decreasing Non-Value-Added Activities"

Emma Bailey, Sydney Mier, Lucas Ribble

Snap-On (Algona, Iowa) Robotic Drawer Line Changeover Reduction

William VanDyck, Jed Wyse, Nicholas Kopanis, Colton Richardson Sukup (Sheffield, Iowa)

"Increasing Product Quality and Throughput"

Abby Poppe, Andie McConnell, Mark Duffie, Ethan Leinen

Marzetti Foods (Des Moines, Iowa) "Reducing Shutdowns and Turnaround Times"

Jolie Jacobus, Kylie Mathison, Sam Schwiejing, Madison Arndt

Zinpro (Garner, Iowa) "Paperless Process Optimization"

Brandon Bulat, Brendan Knap, Brant Charipar, Dylan Brazil

Thelma's Treats (Des Moines, Iowa) "Process Improvements to Prepare for High Volume Line"

Awards and Honors

Industrial engineering alum, Laura Brooks Maxwell, receives Profession Achievement Citation in Engineering (PACE) Award



Throughout an exceptional career in business leadership, **Laura Brooks Maxwell** ('89 industrial engineering) has demonstrated success in roles across diverse units at PepsiCo, the world's leading food and beverage company. Maxwell is currently the senior vice president of supply chain at PepsiCo Foods North America, leading \$21 billion of Frito-Lay and Quaker business. Her leadership spans over 65,000 employees between the two sectors of the business.

After graduating from Iowa State, Maxwell started her career as a project engineer at PepsiCo in Council Bluffs, Iowa. She rose through the leadership ranks to management roles in product innovation, marketing, supply chain, operations, service and distribution, where she was a key driver of growth, performance and change.

C. G. "Turk" and Joyce A. McEwenTherkildsen receive the ISU Foundation's prestigious Order of the Knoll Campanile Award

The ISU Foundation's Order of the Knoll Campanile Award was bestowed upon the Therkildsens for their extraordinary, longtime support and inspiring impact on Iowa State University.

Over the past decade, the couple has made several generous gifts in support of the lowa State Department of Industrial and Manufacturing Systems Engineering. They established the C. G. "Turk" and Joyce A. Therkildsen Department Chair and the C. G. "Turk" and Joyce A. Therkildsen Professor of Industrial and Manufacturing Systems Engineering – named positions that support leading-edge teaching and research and have heightened the department's national profile.

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In 2021, Iowa State announced the Therkildsens' lead gift commitment for a new facility for the department, to be named the Therkildsen Industrial Engineering Building. In fall 2022, the university broke ground for the building, which will offer state-of-the-art, high-tech learning and research laboratory spaces. The gift is the largest ever made for an academic facility at Iowa State.



Research Symposium Winners

Undergraduate Students

Katie Wyatt

Best Poster Award - 1st Place Faculty Mentor: Qing Li Graduate Student Mentor: Yiqun Jiang "Predicting Urgency of Echocardiograms at Mayo Clinic for Improved Scheduling"

Katharine Endersby, Willem Potter and Donovan Schroeder

Best Poster Award - 2nd Place Faculty Mentor: Frank Peters Graduate Student Mentor: Justin Nock "Collaborative Robot System for Sand Mold Washing Process"

William VanDyck

Best Poster Award - 3rd Place Faculty Mentor: Guiping Hu Graduate Student Mentor: Mohammad Fili *"A Machine Learning Approach to Assess COVID-19 Policy Effectiveness"*

Arthur Perron

People's Choice Award Faculty Mentor: Stephen Gilbert Graduate Student Mentor: Mohammadamin Sanaei *"Evaluating Visual Scene Complexity's Effect on Cybersickness"*

Graduate Students

Parvin Mohammadiarvejeh

Best Poster Award - 1st Place Major Professor: Guiping Hu "A Multi-Stage Feature Selection Method to Improve Classification of Super-Ager and Cognitive Decliner Using Structural Brain MRI Data - A UK Biobank Study"

Mehnuma Tabassum

Best Poster Award - 2nd Place Major Professor: K. Jo Min and Gül Kremer "A Novel Design Optimization Framework to Sustain Remanufacturability"

Yiqun Jiang, Shaodong Wang and Wenli Zhang

Best Poster Award - 3rd Place Major Professor: Qing Li *"ICU Mortality Prediction: Can We Do Better? A New Model Based on Machine Learning and Stochastic Signal Analysis Techniques"*

Atousa Arzanipour

People's Choice Award Major Professor: Sigurdur Olafsson "Evaluating Imputation in a Two-Way Table of Means for Training Data Construction"

"I couldn't have done it without the help of my amazing supervisor, Siggi. This award is a testament to the hard work and dedication that we put into this project, and it's incredibly gratifying to see our efforts recognized by others."



Awards and Honors

Graduate Students

Sina Aghakhani, Jiwon Kim, Braden Westby

Harold and Shirley Reihman Graduate Scholars (Fall 2022/Spring 2023)

Blake Clark

Dr. Gerald Lage Academic Achievement Award (Spring 2023); National Football Foundation Hampshire Honor Society (Spring 2023)

Lijie Liu

R. Bruce Thompson Graduate Fellowship from the Center for Non-Destructive Evaluation

Philippe Meister

Outstanding Student Researcher Award from the Federal Aviation Administration, PEGASAS Center of Excellence

Zahra Khalilzadeh

Third place in the Machine Learning for Cyber-Agricultural Systems Competition (Fall 2022)

Teaching Excellence Award

Charchit Shukla (Fall 2022)

The ISU **INFORMS student chapter** received an honorable mention for best student chapter from INFORMS in fall 2022.



Research Excellence Award

Yvonne Farah (Spring 2023) Mohammad Fili (Summer 2022) Matthew Gabriel (Spring 2023) Yanhua Huang (Spring 2023) Zahra Khalilzadeh (Summer 2022) Sharon Lau (Summer 2022) Parvin Mohammadiarvejeh (Spring 2023) Curtis Peters (Fall 2022) Pramiti Sarker (Summer 2022) Shaodong Wang (Fall 2022) Eric Weflen (Spring 2023) Zhuoyi Zhao (Fall 2022)

Conference Proceedings

Pallavi Dubey Yvonne Farah Rick Francis Yanhua Huang Yiqun Jiang Lijie Liu Fatima Mgaedeh Parvin Mohammadiarvejeh Mohammad Ahnaf Sadat Mohammadamin Sanaei Jacklin Stonewall Güliz Tokadli Eric Weflen Braden Westby Xing Zhang Zhuoyi Zhao

Journal Publications

Sina Aghakani Yanbin Chang Yanhua Huang Sang Hyeon Kang Zahra Khalilzadeh Mohammadreza Kiaghadi Fatima Mgaedeh Parvin Mohammadiarvejeh

Zheng Ni Saiara Samira Sajid Charchit Shukla Jacklin Stonewall Güliz Tokadli Eric Weflen Xing Zhang

Undergraduate Students

Zainab Alghalibi Olga Margaret Thompson Endowment (2022-2023)

Madison Arndt, Vaidehee Bahirat and Jolie Jacobus Simio Student Competition Honorable Mention (Fall 2022)

Blake Clark Outstanding Senior (Fall 2022)

Moriah Conner and Katie Wyatt Second place in the Simio Student Competition (Fall 2022)

Kylie Cooper Best Presentation Award for Ivy College of Business MBA Service Learning Consulting Project (Spring 2023)

Carleigh Mach

Raj And Diana Nathan Undergraduate Research Fellowship (2022-2023)

Kylie Mathison College of Engineering Student Marshal and Outstanding Senior (Spring 2023)

Sean O'Shea and Noel Preslicka

ISU's Navy Engineering Analytics Program (NEAP) Scholarship (2022-2023)

Olivia Poppen

Institute of Industrial and Systems Engineers (IISE) Henry and Elizabeth Kroeze Scholarship (Spring 2023)

Willem Potter

Liberal Arts and Sciences Dean's Study Abroad Award (Spring 2023); Ronald A. Schubert Scholarship (Spring 2023)

Kegan Wall

Institute of Industrial and Systems Engineers (IISE) President's Scholarship (2022-2023)

Jed Wyse

Gold Innovation Fellowship from the ISU Student Innovation Center (Spring 2022)

Faculty and Staff

Danial Davarnia

Assistant Professor IMSE Omurtag Junior Research Excellence Award

Michael Dorneich

Professor Jimenez Faculty/Researcher Award from the Federal Aviation Administration's PEGASAS Center of Excellence (2022)

Matt Frank

Slater Professor IMSE's Don Grant Faculty Award for Excellence in Undergraduate Education; ISU Regents Award for Faculty Excellence

John Jackman *Associate Professor* ISU's 35-Year Club

Qing Li

Assistant Professor Building a World of Difference Faculty Fellow in Engineering Award

Leon Liao

Associate Professor Best Paper Award for International Journal of Extreme Manufacturing (2022); IMSE Omurtag Research Excellence Award

Mike Renze

Systems Support Specialist IMSE Omurtag Staff Excellence Award

Jess Severe

Graduate Program Coordinator Liberal Arts and Sciences Merit Excellence Award (2022)



Congrats to our grads!

Fall 2022 degrees conferred

Doctor of Philosophy (Ph.D.) in Industrial Engineering:

Luning Bi Gorkem Emirhuseyinoglu Mohammad Fili Saeed Khaki Carl Joseph Kirpes Pramiti Sarker Jacklin H. Stonewall Hanisha Vemireddy Shaodong Wang

Master of Science (M.S.) in Industrial Engineering:

Joseph Yun-Ming Kim

Master of Engineering (M.Eng.) in Industrial Engineering: Yash Mithunkumar Mistry Monika Kishor Munot

Master of Engineering (M.Eng.) in Engineering Management:

Shannon Dineen Cory Randall Lien David Russell Rishabh Sharma Shyam Sharma

Master of Engineering (M.Eng.) in Systems Engineering:

Alexander Edward Stamer Matthew Karlen Townsend

Bachelor of Science (B.S.) in Industrial Engineering:

Gloria Rosely Almendarez Nicole Marie Aroche Samuel Joseph Austin Izak Neil Baumhover Luke George Becker **Patrick Joesph Bess Jagaruk Nilax Bhatt** Matthew Tambo Booth **Alyssa Megan Bowes** William Grayson Burgess Benjamin John Cahalan Blake Clark **Paul James Crandall Melia Claire Finn** Zacharv N. Ford Michael Robert Freda Sean Ian Gardner Jordan D. Green Vandi Hartanto Matthew G. Hines Guillermo Alberto Iraheta

Makayda Chanel Johnson **Jacob Alan Kauk** Alexander Edward Kock **Benjamin Kole Kroeger Eugene Thomas Meyer** Alexander Kenneth Moses Yajaira Navarro **Emily Ann Nejdl** Minh Nhat Nguyen Shalin Patel Henry P. Roback **Bronson Lincoln Rodgers Erik Paul Officer Rutzen** Mark Lee Stefan **Daniel Forrest Swegle Dalton G. Teeter Andrew Richard Varys** Logan Alan Walsh Andrew Joseph Westercamp Gayle Si Yii



Spring 2023 degrees conferred

Doctor of Philosophy (Ph.D.) in Industrial Engineering:

Zhuoyi Zhao

Master of Science (M.S.) in Industrial Engineering: Blake Clark Kathryn Marie Lieffrig Curtis Earl Peters

Master of Engineering (M.Eng.) in Industrial Engineering: Sanket Rajendra Shah Srujana Vaddepally

Master of Engineering (M.Eng.) in Engineering Management:

Jose L Alfaro Kelly Britt Hoelter Sneha Karthikeyan Parker Miller Nolden Alice Shao Courtney Steege

Master of Engineering (M.Eng.) in Systems Engineering: Joshua Ray Conahan Bachelor of Science (B.S.) in Industrial Engineering:

Madison Arndt **Alexis Ashton Emma Bailev Isaac Bernard** Adam Bohn Lance Bormann Maggi Braun **Dylan Brazil Tyler Brenza Brandon Bulat Charles Bvrd Chase Cagle** Maximilian Cajthaml **Joseph Caleo Brant Charipar** Mason Corpolongo Justin Dabulskis Mark Duffie **Mason Ekblad** Peter Fuciana Maribel Gonzalez **Riley Gora**

Isaac Grindinger Aden Harzman **Jolie Jacobus Brendan Knapp Austin Kollos Nicolas Kopanis** Sierra Kostinec Anthony Lane **Rachel Lasota** Laura Lynch Beniamin Marburger **Kylie Mathison** Andrea McConnell **Maxwell McFadden Sydney Mier Patrick Miller** Cale Nelson Lee Nelson **Brady North Emily Oldham Moriah Paskach Grace Peterson**

Abigail Poppe **Joseph Putman** Lucas Ribble **Colton Richardson** Hector Rivera Hernandez **Charles Roth Joseph Ryan** Samuel Schwierking **Kevin Tebbe Devon Valle** William VanDyck **Andrew Varys** Kegan Wall Logan Walsh Nathan Wetzel **Katie Wyatt Jed Wyse** Daniela Zeledon Ryan Zgonena

Summer 2023 graduate degrees conferred

Doctor of Philosophy (Ph.D.) in Industrial Engineering: Yanhua Huang Eric Weflen Master of Science (M.S.) in Industrial Engineering: **Yvonne Farah Rick Francis Matthew Gabriel Kristina Schaffhausen** Master of Engineering (M.Eng.) in Engineering Management: **Kevin Sitek**

Master of Engineering (M.Eng.) in Systems Engineering: **Elizabeth Little**

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John Aronowitz College of Eng. Development 515-294-4489 johnaron@iastate.edu

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Department of Industrial and Manufacturing Systems Engineering



