ACADEMIC YEAR 2024-2025 NEWSLETTER

MECHANICAL AND INDUSTRIAL ENGINEERING DEPARTMENT

NEWSLETTER HIGHLIGHTS

Editor:
Marzieh Soltanolkottabi

Welcoming Dr. Ganesh Balasubramanian: A New Chapter in Department Leadership

The Department of Mechanical and Industrial Engineering at the University of New Haven proudly welcomed Dr. Ganesh Balasubramanian as its new chair in Fall 2024. Dr. Balasubramanian also holds the prestigious Lambrakis Professorship and brings with him a wealth of experience and vision for the department's future. He earned his BME in Mechanical Engineering from Jadavpur University, India, in 2007 and completed his Ph.D. in Engineering Mechanics at Virginia Tech in 2011. Before joining the University of New Haven, he held faculty appointments at Iowa State University and Lehigh University, where he established a strong record of excellence in teaching, research, and mentorship.

Dr. Balasubramanian is a leading expert in advanced materials and predictive manufacturing, with research supported by NSF, DOD, and DOE. A recipient of the NSF CAREER award and several honors in teaching and research, he brings a forward-thinking vision focused on innovation, collaboration, and academic excellence. His leadership signals a dynamic new chapter for the department.

A Message from the Department Chair

I am excited to share with you the accomplishments of our students and faculty through this newsletter. This being my first year at the University of New Haven, I have been immensely impressed by the passion of our students to engage in hands-on implementation of the knowledge they acquire from their courses, and equally inspiring is the impetus of our faculty to provide active learning opportunities in their classrooms.

Advanced manufacturing can encompass, to list a few, aspects of machining, 3D printing, production efficiency, and data/AI guided fabrication floors, and the demand for a skilled workforce is going to grow in the very near future. Thus, one of our objectives this year was to enable additional programmatic options for students to pursue a concentration in advanced manufacturing and accelerated 4+1 BS+MS pathways by integrating across the programs in the department. Likewise, our recruitment of a new faculty member, the investment in a metal additive manufacturing platform, and engagement of industry experts, have been strategically aligned with our goal to build capacity in the manufacturing domain.

I welcome you to learn more about our department by visiting our website. Please do not hesitate to reach out to me directly.

Ganesh Balasubramanian, PhD
Chair of the MIE Department

New Faculty Spotlight: Dr. Suk Bum Kwon

Expanding Expertise in Advanced Manufacturing

We are excited to welcome Dr. Suk Bum Kwon as a new faculty member in the Department of Mechanical and Industrial Engineering at the University of New Haven. Dr. Kwon joined the department at the beginning of Spring 2025 and brings a strong background in advanced and precision manufacturing. He earned both his bachelor's (2013) and master's (2015) degrees from Yonsei University in South Korea, where his research focused on integrating wire abrasive techniques with electrochemical discharge machining. He went on to complete his Ph.D. in 2022 and continued his academic journey with postdoctoral research at the University of Wisconsin–Madison, concentrating on modeling the removal behavior of anisotropic ceramics in nano-scale machining.

Dr. Kwon's research aims to improve precision and efficiency in modern manufacturing by developing modeling frameworks for machining processes. His areas of expertise include ultra-precision machining, ceramic machining, process modeling, and smart manufacturing. He is particularly interested in leveraging AI-driven technologies to address challenges in manufacturing systems and enhance productivity. Dr. Kwon's work will strengthen the department's focus on advanced manufacturing and bring valuable research and teaching contributions to our students and academic community.

Future-Ready Curriculum

Dual Degrees and Hands-On Manufacturing

1. Launch of New 4+1 Programs Between Mechanical and Industrial Engineering

As part of our continued effort to offer flexible and future-focused academic pathways, the Mechanical and Industrial Engineering Department is proud to announce the launch of new 4+1 dual-degree programs. These programs allow students to earn a Bachelor of Science in Mechanical Engineering and a Master of Science in Industrial Engineering or Engineering and Operations Management in just five years. By integrating undergraduate and graduate coursework, we aim to provide our students with a well-rounded education that prepares them to lead in both technical innovation and systems-level problem solving. This initiative reflects our commitment to interdisciplinary training and to meeting the evolving demands of industry.

2. Advanced Manufacturing Concentration Now Offered in BS Mechanical Engineering Program

We are excited to introduce a new Advanced Manufacturing concentration within our BS mechanical engineering program. This concentration equips students with hands-on experience in cutting-edge technologies such as additive manufacturing, robotics, CNC machining, and smart manufacturing systems. Developed in alignment with Industry 4.0 principles, the concentration is designed to prepare students for high-impact careers in modern manufacturing environments. Our faculty and labs are ready to support students as they explore the digital and automated future of production.

In support of this initiative, we have also expanded our lab capabilities with the acquisition of a state-of-the-art 3D metal printer. This cutting-edge equipment enables students and faculty to explore real-world challenges in metal additive manufacturing, from aerospace components to precision tooling. The new technology not only enhances our research infrastructure but also deepens the experiential learning opportunities available through coursework and senior design projects. Together, the new concentration and advanced lab resources mark an exciting step forward in our commitment to excellence in manufacturing education.

Department Advisory Board Meeting

On March 27, the Mechanical and Industrial Engineering Department held its first unified Department Advisory Board meeting, bringing together industry leaders and academic partners to support the strategic direction of the department. While Mechanical and Industrial Engineering have long existed under the same departmental umbrella, this marks the first time that a single advisory board has been established to represent both programs, strengthening interdisciplinary alignment and fostering a more integrated approach to curriculum development and industry engagement.
We were honored to welcome a distinguished group of board members:

- Rich Cerniglia, General Dynamics Electric Boat
- Ryan Deacon, Raytheon Technologies Research Center
- Jonna Gerken, Pratt and Whitney
- Mark Gurvich, Collins Aerospace
- Leighton Lee, The Lee Company
- Kishore Pochiraju, Stevens Institute of Technology
- Carolina Ramirez-Blier, Medtronic
- Dave Rodriguez, Roehm
- Michael West, Sikorsky

The meeting featured student group presentations highlighting their research and achievements, a review of recent curriculum updates and program revisions, and a tour of the department's enhanced facilities. Board members also had the opportunity to meet with faculty and the Dean of the Tagliatela College of Engineering. Their thoughtful feedback and continued partnership will play a vital role in shaping the department's future as we advance experiential learning, innovation, and workforce readiness for our students.

STUDENTS SUCCESS

Outstanding Ph.D. Student Award

- **Mohammad Basit Akram**

Mohammad Basit Akram is a Ph.D. candidate in Engineering and Applied Science Education program at the University of New Haven focusing on mechanical engineering. His research focuses on predictive modeling and advanced machine learning techniques for process optimization in manufacturing systems. With expertise in time series forecasting and explainable AI, he develops data-driven solutions for real-time monitoring and control of polymer extrusion processes. He holds an M.S. from Lehigh University, Pennsylvania and a bachelor's in engineering from Jadavpur University, India.

Beyond his academic pursuits, Basit enjoys playing Call of Duty and Counter-Strike, immersing himself in strategic gameplay. He also has a deep passion for literature, history, and philosophy, often exploring classic and modern works.

Outstanding Undergraduate Student Award in Mechanical Engineering

- **Tyler Pendleton**

Tyler Pendleton is a senior mechanical engineering student at the University of New Haven, graduating in May 2025 with a concentration in robotics and a minor in mathematics. Dedicated to academic excellence and leadership, he has maintained a 4.0 GPA and has been named to the Dean's List every semester. As a Head Peer Assistant for engineering, he has fostered a collaborative learning environment while mentoring fellow students. Tyler also gained industry experience through an internship at ABB, focusing on mechanical design, testing, and validation. After graduation, he plans to pursue a career in mechanical engineering, applying his skills to innovative and real-world challenges.

Outstanding Graduate Student Award in Mechanical Engineering

- **Keerthivaasan Matheswaran**

Keerthivaasan (Kv) is a graduate student and Research Assistant at the University. During his mechanical engineering bachelor's degree in India, he earned the Best Outgoing Student Award for his involvement in college events and projects. At UNH, he began as a TA, assisting professors and students before receiving the TCoE Endowed Graduate Fellowship. His research is mostly based on robotics, with his thesis exploring teleoperation in the school's industrial robots. Kv has published two research papers and remains active in departmental events. Graduating this May, he plans to pursue a research-focused career and eventually return to academia in the future.

STUDENTS SUCCESS

Outstanding Graduate Student Award in Industrial Engineering

- **Solomon Nelaturi**

Solomon Nelaturi holds a Bachelor of Science in Mechanical Engineering and is currently pursuing a Master's degree in Industrial Engineering. He brings over four years of professional experience as a Quality Analyst, with a strong background in quality control and process improvement. His key areas of interest include Statistics, Design of Experiments, and Supply Chain Management. Solomon is dedicated to applying analytical and data-driven approaches to solve complex problems and add value to business operations. Beyond his academic and professional pursuits, he is an avid ping pong enthusiast and enjoys reading news articles and magazines in his leisure time.

Outstanding Graduate Student Award in Engineering and Operations Management

- **Kasra Fatemi**

Kasra Fatemi is a dedicated mechanical engineer with over eight years of industry experience and is currently completing his M.S. in Engineering Management and Operations at the University of New Haven, where he also earned his B.S. in Mechanical Engineering. He has a strong background and interest in plastics injection molding, tooling, and automation. As an Engineering Manager at Medtronic, he leads a team of engineers in developing and delivering plastic injection molds to produce critical-level components for patients. Kasra looks forward to applying his newly acquired degree to continue driving impactful innovations in the medical device space.

STUDENTS SUCCESS

Outstanding Graduate Service Award – Engineering and Operations Management

- **Seyedeh Elham Kamali**

Elham is an Engineering and Operations Management student with dual master's degrees in Electrical Engineering. She has worked as a Project Engineer Intern at Entech Engineering PC in New York and as a Teaching Assistant at the University of New Haven. Currently, she serves as President of the IISE Student Chapter. With over 10 years of industry experience, she has held leadership roles such as Technical Manager and Supervising Electrical Engineer. A recognized researcher, Elham earned second place in a 2024 research workshop and has published work in Elsevier. She has plan to advancing research and fostering academic and industry collaborations.

Outstanding Graduate Service Award – Industrial Engineering

- **Tejas Warungase**

Tejas, originally from India, is a dedicated Industrial Engineering graduate student, set to graduate in May 2025. He holds a bachelor's degree in Mechanical Engineering and transitioned into Industrial Engineering to further develop his expertise in process optimization and efficiency. Recognized as one of the top GPA holders in his department, he is a recipient of the Provost Scholarship, previously holding Dean's Scholarship. Tejas has served as the Logistics and Hospitality Manager for the Indian Student Council, worked as a Graduate Assistant for the International Admission Office, and currently holds a Teaching Assistant position in the Mechanical and Industrial Engineering Department. With a strong passion for process optimization, he has hands-on experience as a Manufacturing Engineer, working on automation projects. Tejas is eager to gain industry exposure at reputed companies and aims to start his career as an Industrial Engineer or Process Engineer leveraging his analytical skills and leadership experience.

STUDENTS SUCCESS

Outstanding Undergraduate Service Award – Mechanical Engineering

- **Alexandra Iozzo**

Alexandra Iozzo is the vice president of the American Society of Mechanical Engineers and vice president of the Engineering Council. Outside of school, she works with the university as a Tagliatela College of Engineering Ambassador, as well as a Women in Engineering Ambassador. She has interned at the Milford Power Plant and Mannkind Corporation. Playing golf and baking are some of her favorite hobbies.

Outstanding Graduate Service Award – Mechanical Engineering

- **Yashwanth Kanthala**

Yashwanth is a graduate student from India, pursuing a Master of Science in Mechanical Engineering at the University of New Haven. As the recipient of the Outstanding Graduate Service Award, Yashwanth is dedicated to academic excellence, research, and innovation and currently serves as a Teaching Assistant, supporting class assignments and conducting labs. Yashwanth's research focuses on molecular dynamics simulations, investigating heparin interactions with fibrinogen, antithrombin, and PF-4 using NAMD, VMD, and OVITO, aiming to enhance understanding of clot structure and stability for biomedical applications. Yashwanth is eager to explore innovative solutions in structural analysis, performance optimization, and molecular dynamics, contributing meaningfully to the field.

"Congratulations to all the 2025 student award winners in the Tagliatela College of Engineering. We are proud of your academic and service contributions."

– Ronald S. Harichandran, Ph.D., P.E., F.ASCE; Dean, Tagliatela College of Engineering

GRADUATE STUDENTS SHOWCASE

We are proud of our graduate students who presented their research at the Graduate Student Showcase on April 2, demonstrating creativity, analytical thinking, and a strong commitment to advancing engineering knowledge. We also extend our sincere thanks to the faculty advisors for their valuable mentorship and support in guiding these impactful projects.

Victhoria De Castro Lima
“Simulation and Analysis of a Pharmacy Prescription and Vaccination System to Identify Bottlenecks and Optimize Customer Experience.”

Pawan Kalyan Babji Puthineedi
Evaluating the Impact of Input Power, Driver Output and Correlated Color Temp. (CCT) on Efficacy of LED’s

Seyedeh Elham Kamali
AI in Engineering Curricula: Adoption, Challenges, and Ethical Considerations Among Engineering Students

CAPSTONE DESIGN EXPO

Kudos to our students who showcased their Capstone Design projects at the Capstone Design Expo on May 6. Their creativity, technical skills, and teamwork were on full display, reflecting the strength of our academic programs. We are especially proud to congratulate the First Place and Third Place award-winning teams from the Mechanical and Industrial Engineering Department—an outstanding achievement that highlights our students' excellence in engineering design and problem-solving.

We extend our heartfelt thanks to the dedicated faculty advisors, our industry sponsors, and Dr. Orabi for their exceptional support and coordination of this successful event. Your efforts continue to make hands-on learning and real-world impact a cornerstone of our department.

Fast Active Vibration Actuator
Team members: Semih Akyuz, Angela Mercaldi, and Tyler Pendleton
Faculty advisor: Dr. Ismail Orabi

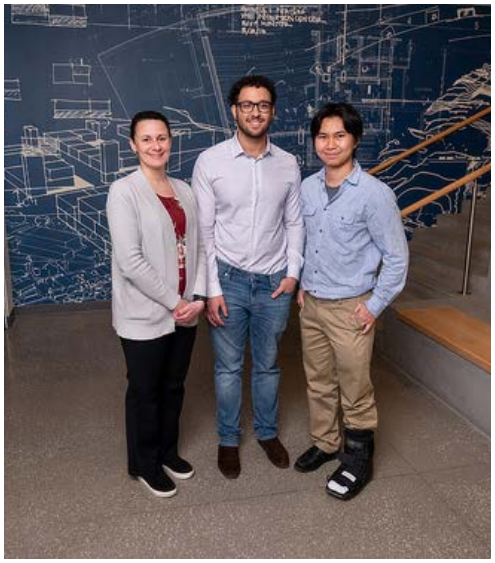
This project aimed to validate and optimize a fast active vibration compensation system that enhanced performance, reduced latency and weight, and improved comfort and durability through innovative power delivery.

Optimization of Weld Cart

Team members: Alexandra Iozzo, Benjamin George, and Matthew Gomerez
Faculty advisor: Dr. Ismail Orabi

This project aimed to enhance and optimize Edgewell's blade strip welding and dressing processes by designing and testing solutions to streamline operations, ultimately reducing production time and increasing overall efficiency.

CAPSTONE DESIGN EXPO



Relief Valve Optimization

Team members: Ashton Brunell, Phelopateer Ibrahim, and Benjamin Norodom
Faculty advisor: Dr. Joseph A. Levert

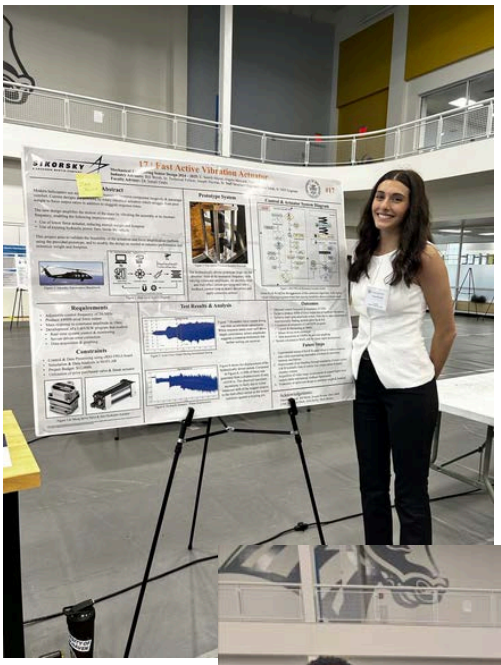
This project aimed to optimize a relief valve design to minimize vibration during seating, extend service life, and improve overall system performance and reliability.

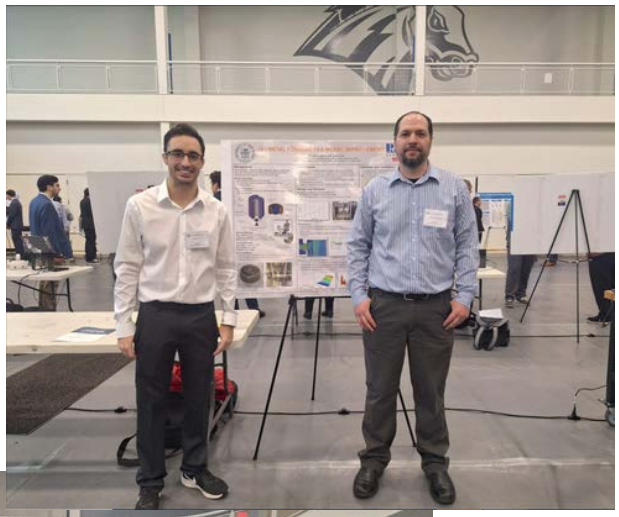
Metal Forming FEA Model Improvement

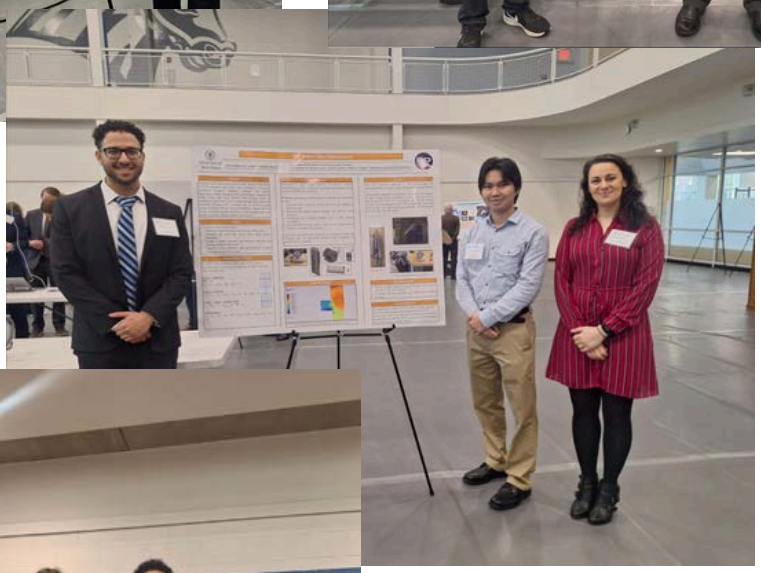
Team members: Justin Ortiz and Michael Coppola
Faculty advisor: Dr. Ismail Orabi

This project aimed to reduce design time and costs for Heim Bearing by improving their swaged bearing FEA model through physical testing and optimization of tooling specifications.

CAPSTONE DESIGN EXPO



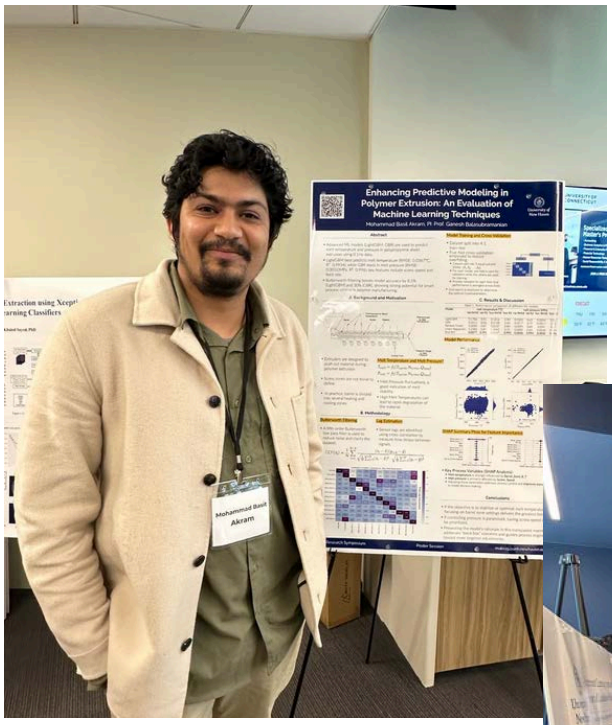


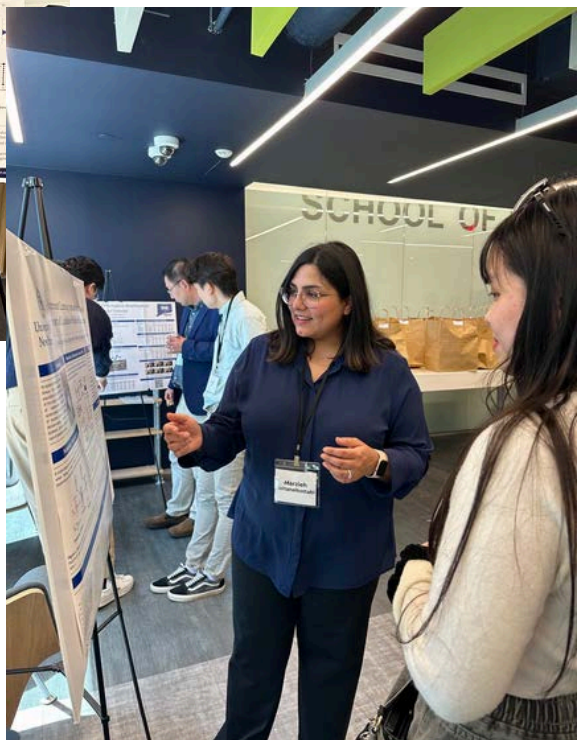


CAIA SYMPOSIUM AND HARTFORD AI DAY

On April 23, two research teams from the Mechanical and Industrial Engineering Department proudly presented their work at the CAIA Symposium at Hartford AI Day, showcasing the department's growing engagement in data-driven and AI-integrated engineering research. Their innovative projects reflected the strong mentorship of our faculty and the students' commitment to addressing real-world challenges using advanced computational tools.
Presented Posters:

- Enhancing Predictive Modeling in Polymer Extrusion: An Evaluation of Machine Learning Techniques, Author: Mohammad Basil Akram | Advisor: Prof. Ganesh Balasubramanian
- Reinforcement Learning Approach to Evaluation and Decision Support of Lockdown Policies for Epidemic Outbreaks, Author: Merishna Singh Suwal | Advisors: Dr. Marzieh Soltanolkottabi and Dr. Vahid Behzadan





CONNECTICUT AI ALLIANCE
SMARTER TOGETHER

RESEARCH SEMINAR SERIES HIGHLIGHTS

The Mechanical and Industrial Engineering Department hosted a series of insightful research seminars during the 2024–2025 academic year, bringing together faculty, students, and invited experts to explore cutting-edge developments in engineering research and innovation.

- On October 23, 2024, Dr. Suk Bum Kwon presented his research on "**Anisotropic Material Removal Behavior during Micromachining**." His talk examined the micromachining of single-crystal materials like sapphire, combining molecular dynamics simulations and experimental insights to model crack formation and improve machining precision.

- Dr. Suvojit Ghosh (Founder of FYELABS) opened the series on February 20, 2025, with an interactive session titled "**Working in the Innovation Ecosystem**." Dr. Ghosh guided students through key principles of startup development, lean product innovation, and entrepreneurial ecosystems, encouraging participants to explore commercialization paths for their ideas.

- On March 6, 2025, Dr. Jiong Tang, Pratt & Whitney Chair Professor at the University of Connecticut, delivered a talk on "**Engineering of Vibratory Systems through Piezoelectric Circuitry**." His seminar highlighted innovative uses of piezoelectric materials in structural sensing, vibration control, and damage diagnostics through advanced electromechanical integration.

- The series continued on April 17, 2025, with a seminar by Dr. Nikhil A. Koratkar of Rensselaer Polytechnic Institute, titled "**Battery Electrodes: Nano vs Micro-Structuring**." Dr. Koratkar compared nano- and micro-particle electrode designs, proposing multiscale particle approaches for next-generation energy storage solutions.

These seminars offered valuable learning opportunities, inspiring students and faculty alike to explore emerging technologies and interdisciplinary approaches in mechanical and industrial engineering.

IISE SKILL-BUILDING WORKSHOPS

The IISE Student Chapter is a student-led organization housed within the Mechanical and Industrial Engineering Department at the University of New Haven. This spring, the chapter organized two highly engaging and practical workshops taught by faculty members, aimed at equipping students with industry-relevant skills in simulation and project management.

On March 21, Dr. Narjes Sadeghiamirshahidi led "**From Data to Decisions: Supply Chain Logistics Modeling in AnyLogic**," introducing students to supply chain simulation, logistics modeling, and data-driven decision-making using the AnyLogic platform.

Following that, on April 11, Dr. Marzieh Soltanolkottabi conducted "**Mastering Project Management with Microsoft Project**," a hands-on session where students learned how to build and manage project schedules, track progress, allocate resources, and create dashboards using Microsoft Project.

Both free workshops were open to all students and exemplify IISE's mission to enhance student learning outside the classroom by connecting academic knowledge with professional tools and real-world applications.

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FELLOWSHIPS AND AWARDS

Dr. Nadiye Erdil Selected for Prestigious CCAT Faculty Fellowship on Digital Transformation

We are proud to share that Dr. Nadiye Erdil, Associate Professor of Industrial and Systems Engineering, was selected as one of nine faculty members statewide to participate in the Connecticut Center for Advanced Technology (CCAT) Faculty Fellowship Program for Digital Transformation. This immersive program provided approximately 100 hours of training in advanced manufacturing technologies, including digital thread integration, model-based design, and Industry 4.0 best practices, equipping faculty to bring these innovations directly into their classrooms.

Through this fellowship, Dr. Erdil is helping to ensure that our students are prepared for the demands of the Fourth Industrial Revolution, where the integration of smart sensors, real-time data, and intelligent systems is transforming the future of engineering and manufacturing.

Dr. Soltanolkottabi Receives 2025 IISE Outstanding Regional Faculty Advisor Award

We are proud to share that Dr. Marzieh Soltanolkottabi has received the 2025 Outstanding Regional Faculty Advisor Award from the Institute of Industrial and Systems Engineers (IISE) for the University of New Haven Chapter and the U.S. Northeast Region. This award recognizes her exceptional contributions in mentoring students, fostering leadership, and supporting professional development through the IISE student chapter. Dr. Soltanolkottabi will be honored at the 2025 IISE Annual Conference & Expo in Atlanta, GA, and has also been nominated for the Outstanding Global Faculty Advisor Award.

PUBLICATIONS

Faculty members from the Mechanical and Industrial Engineering Department at the University of New Haven continue to demonstrate impactful research across a range of cutting-edge topics, from materials science and nanoengineering to healthcare optimization. The following recent and forthcoming publications reflect the department's commitment to advancing knowledge and contributing to global scientific and engineering communities:

Dr. Ganesh Balasubramanian:

- Abir, S. S. H., Sharma, S., Sharma, P., Karla, S., Balasubramanian, G., Samuel, J., & Koratkar, N. (2024). **Piezoelectricity in chalcogenide perovskites**. Nature Communications, 15(1), 5768.
- Banerjee, T., & Balasubramanian, G. (2025). **Hydrogen diffusion induced dislocation transformations in a nickel superalloy**. Fuel, 384, 134064.
- Sharma, P., Tucker, W. C., & Balasubramanian, G. (2025). **Optimal interplay of charge localization, lattice dynamics and slip systems drives structural softening in dilute W alloys with Re additives**. International Journal of Refractory Metals and Hard Materials, 107086.

Dr. Suk Bum Kwon:

- Kwon, S. B., & Min, S. (2024). **Studying mechanism of anisotropic crack generation on C-, R-, A-, and M-planes of sapphire during ultra-precision orthogonal cutting using a visualized slip/fracture activation model**. Nanotechnology and Precision Engineering, 7(4).

Dr. Joseph Levert:

- McGowan, C., & Levert, J. A. (2025). **Model correlating polishing to abrasive particle friction for chemical mechanical polishing**. ASME Journal of Tribology. (Accepted for publication).

Dr. Marzieh Soltanolkottabi:

- Ghalenoei, F., Soltanolkottabi, M., & Khorshidi, H. A. (2025). **Optimizing referral strategies for whole genome sequencing in lung cancer diagnosis**. Proceedings of the Institute of Industrial and Systems Engineering (IISE) Annual Conference. (Accepted for publication).

Dr. Sumith Yesudasan:

- Yesudasan, S. (2025). **Evaporation characteristics of heat pipes with sub-critical nanopores**. Molecular Physics, e2472975.

CONFERENCE PRESENTATIONS

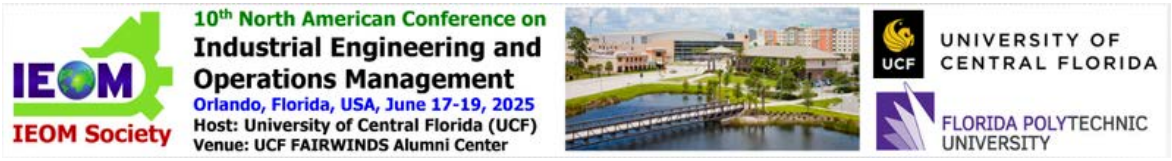
Faculty members and students from the Mechanical and Industrial Engineering Department continue to gain national recognition for their research through upcoming presentations at prestigious conferences.

Workshop

Dr. Nadiye Erdil will be co-leading a pre-conference workshop at the IISE Annual conference 2025 titled **Engineering Unleashed: Engaging Minds, Empowering Industrial and Systems Engineers**. Co-organized with academic and industry leaders, the workshop will provide participants with tools and strategies to foster innovation, collaboration, and value creation in their projects and organizations.

Research Presentation

Dr. Marzieh Soltanolkottabi will present her research paper titled "**Optimizing Referral Strategies for Whole Genome Sequencing in Lung Cancer Diagnosis**" at the 2025 IISE Annual Conference. The paper, co-authored with F. Ghalenoei and H.A. Khorshidi



Research Presentations

Dr. Ali Montazer and his students have two abstracts accepted to the 2025 North American IEOM Conference, to be held in June in Orlando, FL. The accepted works are:

- Simulation Modeling and Analysis of Autonomous Vehicles in a Manufacturing Environment by Kasra Fatemi and Dr. Montazer
- Simulation and Analysis of a Pharmacy Prescription and Vaccination Processes by Victhoria De Castro Lima and Dr. Montazer

Research Presented at 2025 POMS Conference

Dr. Marzieh Soltanolkottabi will present "Rolling Horizon Two-Stage Stochastic Programming for Hurricane Relief Logistics" (co-authored with A. Tolooie) at the 2025 POMS Annual Conference, highlighting innovative approaches to disaster response planning.

POMS
PRODUCTION & OPERATIONS MANAGEMENT SOCIETY