M&S DIVISION NEWSLETTER SUMMER 2026

INSTITUTE OF INDUSTRIAL & SYSTEMS ENGINEERS

MODELING & SIMULATION DIVISION

A Message from the Division President:

Dear Modeling and Simulation Division Members,

I am honored and excited to begin my term as President of the Modeling and Simulation Division at such an important and transformative time. Artificial intelligence is rapidly changing how we work, teach, learn, and innovate across academia and industry. As with any powerful new technology, there is much to learn about how to use it effectively, responsibly, and in ways that maximize its benefits.

Our division is uniquely positioned to bring people together to engage in these discussions on how to effectively integrate AI with modeling and simulation. On a range of topics including AI literacy, leveraging AI with our core methods to solve complex societal challenges, and AI risk, safety, ethics, and responsible deployment. On topics relevant across the classroom, research, and industry.

This moment is especially unique I believe, as we, as academics, are learning alongside our students at an unprecedented pace, or we, as industry practitioners, are learning to adapt to changes at an unprecedented pace. As industry continues to evolve, open questions include how can we work together across academia and industry, to leverage AI for good, while ensuring that students develop the knowledge, skills, and critical thinking needed to contribute to and thrive in an AI-enabled future.

In this newsletter you will find:

Election results, conference recap, student spotlight, and more.

This excitement and commitment to responsible-AI engagement, I believe, is shared by our members, as was evident at the 2026 IISE Annual Meeting in Arlington, Texas. Modeling and Simulation track sessions showcased innovative research, real-world applications, and emerging tools through presentations and workshops related to AI, modeling and simulation. Our Townhall special session brought together diverse perspectives and sparked meaningful discussions on AI in Modeling and Simulation, the opportunities and challenges ahead. We highlight some of these #IISE2026 events in this newsletter.

I would like to extend my sincere gratitude to our 2025-26 president and past-president, track chairs, award committee members, reviewers, and Board members for their dedication and hard work in making the Annual Meeting such a success. Their efforts continue to strengthen and advance our division. I would also like to extend a warm welcome to our new Board members. I look forward to working with you all.

As we look ahead, I welcome your ideas and suggestions for how we can build on this momentum to continue these conversations throughout the year and at the next annual meeting. Whether through webinars, podcasts, panel discussions, or other activities, I welcome your thoughts on how we can best serve and strengthen our community.

I look forward to working with all of you in the year ahead.

CHAITRA GOPALAPPA
PRESIDENT, IISE M&S DIVISION
2026-2027
CHAITRAG@UMASS.EDU



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Get to know the new board members...



Dr. Eduardo Pérez is a Professor of Industrial Engineering at Texas State University's Ingram School of Engineering, where he serves as the founder and director of the Integrated Modeling and Optimization for Service Systems (iMOSS) research laboratory. His research and educational work focus heavily on using advanced modeling and simulation methodologies, such as discrete-event and agent-based simulation, alongside stochastic programming to support complex decision-making under uncertainty. His applied work leverages these simulation tools to optimize operations and improve resource allocation across critical service systems, including healthcare delivery, disaster public health response, and homeland security logistics. **Fun fact:** Eduardo's YouTube channel serves as a thriving academic hub, connecting an impressive community of about 5,000 subscribers with real-world insights into industrial engineering and optimization modeling.



Dr. Chrysafis Vogiatzis is a Teaching Associate Professor of Industrial & Enterprise Systems Engineering at the University of Illinois Urbana-Champaign. His academic interests lie in network analysis and optimization, along with their vast applications in modern socio-technical systems. His activities have been funded by the Army Research Lab and the National Science Foundation, with his most recent funding being on the investigation of illicit drug supply chain networks. He is also a member of the Education Justice Project. Chrysafis has been recognized for his teaching on several occasions including IISE M&S Teaching Award in 2025. **Fun Fact:** Chrysafis loves cooking and baking, and he makes a different dessert for my family every week.



Dr. Valentina Nino is an Assistant Professor of Industrial and Systems Engineering at Kennesaw State University and Director of the Human Factors, Operations Optimization, and Ergonomics (HOPE) Lab. Her research applies discrete-event simulation, systems modeling, and human factors engineering to improve healthcare operations, with projects spanning operating room scheduling, sterilization processing departments, vaccination clinics, and the evaluation of emerging healthcare technologies to enhance efficiency, safety, and clinician well-being. **Fun fact:** One of my favorite ways to recharge is traveling and experiencing different cultures through their food, history, and local traditions.

Meet our Student Volunteers



Yukti Kathuria is a PhD student in Industrial Engineering at the University of Massachusetts Amherst. Yukti's research focuses on probabilistic and optimization methods for healthcare decision-making. Her work includes bayesian network modeling of cardiovascular disease risk in patients with type 2 diabetes using longitudinal electronic health record data, as well as multi-criteria optimization approaches for improving equitable access to healthcare. **Fun fact:** Yukti is a handwritten-card aficionado and enjoys long-form pen palling and collecting and sending postcards to her family and friends.



Md Parvez Shaikh is a first-year PhD student in Industrial, Manufacturing, and Systems Engineering at the University of Texas at Arlington. Parvez's research develops participatory agent-based modeling frameworks to study human decision-making and coordination in decentralized logistics systems. His primary areas of interest include agent-based modeling, digital twins, food supply chain resilience, and humanitarian logistics. **Fun fact:** Outside of research, Parvez is a passionate traveler and hobbyist drone pilot, always in search of the next great aerial shot.

THANK YOU OUTGOING BOARD MEMBERS!

WE APPRECIATE ALL OF YOUR CONTRIBUTIONS



Shima Mohebbi
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ANDRES ACERO
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Highlights from the IISE Annual Conference & Expo 2026



M&S TRACK BY THE NUMBERS

24 SESSIONS

79 PRESENTATIONS

24 PAPERS
(35 RECEIVED, 31% REJECTED)

Thank you to the Conference Abstract and Paper Reviewers:

- Lihui Bai, University of Louisville
- Kaiming Bi, UTHealth Houston
- Fan Bu, Texas Tech University
- David Claudio, U. Massachusetts Lowell
- Chaitra Gopalappa, UMass Amherst
- Tongdan Jin, Texas State University
- Zeyu Liu, West Virginia University
- Junfeng Ma, Mississippi State University
- Shima Mohebbi, George Mason University
- Marzieh Soltanolkottabi, University of New Haven
- Haifeng Wang, Mississippi State University
- Mengfan Xu, UMass Amherst

ANNOUNCED AT TOWN HALL:

The ISE Body of Knowledge (BoK) was updated to be inclusive of M&S so item 2 now reads “Operations Research and Simulation Modeling”

Annual Teaching Award

The Modeling & Simulation Teaching Award recognizes transformative power of education with special honor for igniting curiosity, foster growth, and inspire next generation of leaders & thinkers.

The award celebrates excellence in pedagogy, recognizing instructors who demonstrate exceptional dedication to students' learning & development and the profound impact the educators make on 100s, even 1000s of individual lives, also on our community.

CONGRATULATIONS
TO SEUNGHAN LEE!



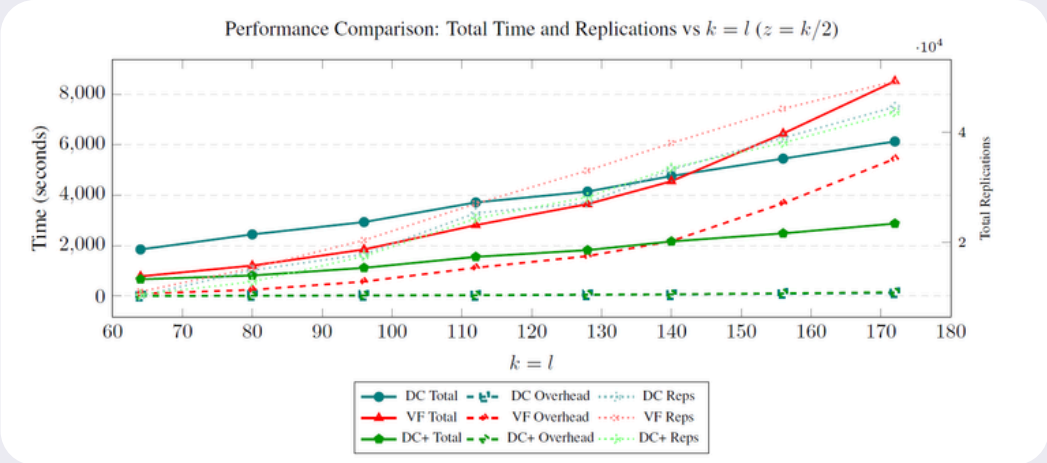
Among the many positive impressions from Dr. Lee's students, one writes:

"I have modeled elements of my own undergraduate teaching on his approach particularly for use of structured questioning conceptual reinforcement and deliberate student engagement."

2026 Best M&S Student Paper Award

CONGRATULATIONS TO SEOKJOON OH!

“Accelerating Large-Scale Fixed-Precision Pareto Set Selection in Parallel Environments”





The problem. In complex real-world decision-making, we often need to find the best trade-off solutions (the Pareto set) among thousands of system designs using simulation. When running these large-scale simulations in parallel, existing methods like Vector Filling (VF) suffer from severe computational bottlenecks. A single master processor must continuously compare every design against all others, causing massive synchronization delays and traffic jams.

The solution using Modeling and Simulation. To overcome this, I developed a "Divide-and-Conquer" simulation framework called PSSP-DC and DC+ (DC combined with VF procedure). Instead of comparing all designs globally at once, the framework divides them into smaller, independent "local leagues" across multiple processors. Only the top surviving designs from these local leagues advance to a final championship stage. This approach drastically cuts down the comparison traffic and simulation overhead while mathematically guaranteeing that we still select the correct best designs (Probability of Correct Selection).

The Impact. By eliminating the central computational bottleneck, this framework allows decision-makers to evaluate massively large-scale design options in a fraction of the time. It unlocks the ability to solve highly complex, multi-objective optimization problems much faster and more efficiently than before, maximizing the utilization of parallel computing resources.

2026 Best M&S Track Paper Award

CONGRATULATIONS TO YUCHENG WU AND ALP AKCAY!





Data-Driven Resource Aggregation for Scalable Digital Twin and Simulation Model Generation

In manufacturing, digital twins are increasingly used as virtual replicas of factory systems due to their ability to predict system performance and support decision-making through simulation. However, as factories grow larger and more complex, building and maintaining a detailed simulation model for every individual machine becomes costly and difficult to manage. The goal of this work is to automatically construct simulation models from historical production data while relieving human modelers of the burden of determining the appropriate level of detail to include.

To this end, we developed a method that automatically learns machine behavior from historical production data and intelligently groups machines that perform similar roles into clusters. This is achieved using inverse reinforcement learning, which infers the underlying decision logic of the factory from observed production data. The resulting simplified simulation model replaces groups of individual machines with representative resources, substantially reducing the size of the discrete-event simulation model while preserving accuracy on key performance metrics.

We evaluated our approach on a flexible flow shop system, a production environment commonly found in semiconductor back-end assembly. In an illustrative case study with 3 production stages and 19 machines in total, our method reduced these 19 machines to 7 representative resource clusters. Despite this substantial reduction in model complexity, the aggregated simulation model achieved errors below 2% for both production throughput and average flow time compared with the full machine-level simulation. The proposed approach can make simulation models easier to build, maintain, and scale. This capability is a critical advantage in rapidly changing manufacturing environments where manual model updates are frequently required.

Award Winners at the M&S Division Town Hall

Congratulations to all of the Best M&S Track Paper Award Finalists:

- “Context-Aware Communication for Smooth Control Delegation in Semi-Autonomous Driving” by Roohollah Jahanmahin, Yuzhou Chen, Sara Masoud, and Neda Masoud.
- “Predicting Difficult-to-measure Defects in Additive Manufacturing via Graph-based Integrative Modeling” by An-Tsun Wei, Tochukwu Nwokolo, Hui Wang, Vincent Asare-Manu, and Jingjing Li.
- “Hybrid Random Forest Framework for Space Debris Decay Modeling Using Iridium-Cosmos Collision Data” by Mustafizur Rahman, Tzu-Liang Bill Tseng, Solayman H. Emon, Chin-Yih Lin, Md Fashiar Rahman, and Chun-Che Huang.
- “Data-driven resource aggregation for scalable digital twin and simulation model generation” by Alp Akçay and Yuchang Wu.



Alp Akcay accepting the 1st place award.



Hui Wang accepting the 2nd place award.



Congratulations to all of the Student Paper Award Finalists:

- “Projecting Electric Vehicle Adoption Growth via Hybrid Agent-Based Modeling and System Dynamics Framework” by Bates Bennett, Victoria Rutledge, Seunghan Lee, and Jee Eun Kang.
- “Hidden Markov Modeling of Module-Level Errors for Runtime Monitoring in Digital Twins” by Annice Najafi and Shokoufeh Mirzaei.
- “Surrogate Models for Simulation Models with Embedded Reinforcement Learning Agents” by Mohammadmahdi Ghasemloo, David J. Eckman, and Yaxian Li.
- “Accelerating Large-Scale Pareto Set Selection with guaranteed probability of correct selection : A 2-Stage Divide-and-Conquer Procedure for Parallel Environments” by Seokjoon Oh.

Student Spotlight
From Theory to Practice: Transforming FlexLatam Through Simulation



Rodrigo Esqueda Garay



Diego Casillas Buelna

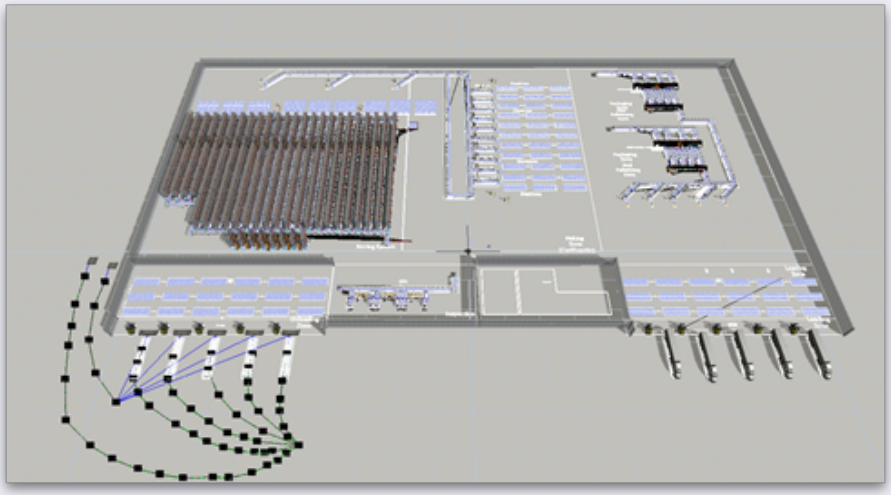


José Mario Villavicencio Lara

Final Delivery NK Solutions

Abstract: The project addressed the challenge of FlexLatam Warehousing Inc., a distribution center needing to evaluate the transition from manual operations to automated Industry 4.0 facilities to support its growth. Our objective was to act as a consulting firm to develop a simulation enabling data-driven strategic decision-making. The method involved a steep learning curve; through self-taught research, trial, and error, we mastered FlexSim's Process Flow to program two 3D models: the current forklift-dependent operation and the improved proposal featuring an Automated Storage and Retrieval System (ASRS) and robotic arms. The simulation results confirmed the value of the proposed system: we achieved a 38% reduction in average fulfillment time and a 42% increase in total dispatch capacity. This experience consolidated our ability to transform theory into tangible industrial solutions.

Impact: By participating in the XV Latin American Logistics Simulation Contest, we solved the FlexLatam case study. We developed an automated model in FlexSim that proved highly efficient, successfully reducing fulfillment times by 38% and increasing dispatches by 42%.



Upgraded Flexsim model



Under the guidance of Dr. Samuel Nucamendi

Get Involved



ISE DAY IS A GLOBAL MOVEMENT UNITING INDUSTRIAL AND SYSTEMS ENGINEERS, STUDENTS, AND ACADEMICS TO SHOW THE WORLD WHAT ISE DOES – AND WHY IT MATTERS.

How to make an impact:

- Share your ISE story on Instagram, TikTok, and LinkedIn. Use #ISEday and #ISEday2026. Tag IISE.
- Attend an Online Virtual Event https://iseday.iise.org/#virtual-events.
- Organize an ISE event at your organization or university.

More ideas and templates here: https://iseday.iise.org/#participate

Join the M&S Division and stay connected

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- Join our LinkedIn group to stay connected: https://www.linkedin.com/groups/12741693
- Follow our LinkedIn page to share content with the M&S professional network: https://www.linkedin.com/company/iise-modeling-and-simulation-division/