

MICHAEL KATSIGIANNIS

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ACADEMIC APPOINTMENTS

2026 - Present: **Assistant Professor**
Department of Mechanical Engineering - Industrial Engineering program,
University of South Carolina, Columbia, SC

EDUCATION

2020 - 2026: **Ph.D., Industrial and Systems Engineering,**
Auburn University Samuel Ginn College of Engineering, Alabama, USA.
Dissertation: Digitalizing Assembly Operations Using Agent-Based-Modeling Techniques and
Digital Twin Technologies
Advisor: Dr. Konstantinos Mykoniatis

2020 - 2024: **Master of Science, Industrial and Systems Engineering,**
Auburn University Samuel Ginn College of Engineering, Alabama, USA.

2011 - 2020: **Integrated Master's, Electrical and Computer Engineering,**
Technical University of Crete, Greece.
Thesis: Balancing Expected Thermal Discomfort and HVAC Operation Cost in Buildings
With Dynamic Occupancy Schedules.
Advisors: Dr. Georgios Chalkiadakis and Dr. Athanasios Panagopoulos

RESEARCH INTERESTS

Digital Twins, Digital/Intelligent Manufacturing, Artificial Intelligence, Modeling and Simulation, Industrial Internet of Things, Robotics and Automation

AWARDS

2024: **Chapman Foundation Simulation Fellowship Award**
\$10,000 fellowship to a graduate student doing outstanding research advancing the field of Simulation

2021-2025: **Walt and Virginia Woltosz Fellowship**
\$24,000 fellowship offered to a select group of candidates who have the potential to excel in graduate studies at Auburn.

2021: **December 2021 Student Simulation Competition**
Honorable Mention Charts and Plots Master. "Blazing the Pattern Frontier" - Team AU

2020: **Gianni Cantice Award for Gifted Simulation Students**
Provided by Liophant Simulation in recognition of the scholarly and scientific relevance of the paper submitted and presented at I3M 2020

PEER-REVIEWED JOURNAL PUBLICATIONS

- J1 (Under Review) Katsigiannis, M. and Mykoniatis, K.
"Multi-Agent-Based Digital Twin Engine for Manufacturing Operations"
Journal of Intelligent Manufacturing, 2026.
- J2 Katsigiannis, M., Pantelidakis, M. and Mykoniatis, K.
"Assessing the Transition from Mass Production to Lean Manufacturing Using a Hybrid Simulation Model of a LEGO® Automotive Assembly Line."
International Journal of Lean Six Sigma, 2024.
- J3 Panagopoulos, A.A., Christianos, F., Katsigiannis M., Mykoniatis, K., Chalkiadakis, G., Pritoni, M., Peffer, T., Panagopoulos, O.P., Rigas, E.S., Culler, D.E. and Jennings, N.R.
"iPlugie: Intelligent Electric Vehicle Charging in Buildings With Grid-Connected Intermittent Energy Resources."
Simulation Modelling Practice and Theory, 115, p.102439, 2022.
- J4 Panagopoulos A.A., Christianos F., Katsigiannis M., Mykoniatis K., Pritoni M., Panagopoulos O.P., Peffer T., Chalkiadakis G., Culler D.E., Jennings N.R. and Lipman T.
"A Low-Complexity Non-Intrusive Approach to Predict the Energy Demand of Buildings Over Short-Term Horizons"
Advances in Building Energy Research, 2020.

PEER-REVIEWED CONFERENCE PROCEEDINGS PUBLICATIONS

- C1 (In Print) Vythoulka, V., Katsigiannis, M. and Pantelidakis, M.
"Enhancing Information Exchange in Distributed Manufacturing Through Blockchain Integration"
North American Manufacturing Conference, 2026.
- C2 Katsigiannis, M. and Mykoniatis, K.
"Real-Time Tracking of Production in Assembly Operations Using Agent-Based Modeling and Digital Twin Techniques"
2024 Winter Simulation Conference (WSC), 2024.
- C3 Katsigiannis, M. and Mykoniatis, K.
"Enhancing Industrial IoT with Edge Computing and Computer Vision: An Analog Gauge Visual Digitization Approach"
North American Manufacturing Research Conference, 2024
Published in **Manufacturing Letters** 41, 2024.
- C4 Katsigiannis, M., Evans, M., Osho, J., Pantelidakis, M., Bitencourt, J. and Mykoniatis, K.
"Empowering Decentralized Production: A Distributed Manufacturing System for Additive Manufacturing Processes."
North American Manufacturing Research Conference, 2024
Published in **Manufacturing Letters** 41, 2024.
- C5 Katsigiannis, M., Pantelidakis, M., Mykoniatis, K. and Purdy, G.
"Current Monitoring for a fused filament fabrication additive manufacturing process using an Internet of Things system"
North American Manufacturing Research Conference, 2023
Published in **Manufacturing Letters** 35, 2023.
- C6 Pantelidakis, M., Katsigiannis, M., Mykoniatis, K., Purdy, G. and Liu, J.
"Condition Monitoring for Overall Equipment Effectiveness using Internet of Things, Edge Computing, and Extended Reality."
3rd International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME), 2023.
- C7 Mykoniatis K., Shirzaei S., Katsigiannis M., Panagopoulos A.A., Deb S., Potter T., Angelopoulou A.
"Society 5.0: A Simulation Study of Self Checkout Operations in a Grocery Store."
32nd European Modeling & Simulation Symposium, 2020.

- C8 Panagopoulos A.A., Katsigiannis M., Pritoni M., Fierro G., Lengyel D., Pepper T. E., Chalkiadakis G., and Culler D.
"Dealing with Expected Thermal Discomfort.",
ACEEE Summer Study on Energy Efficiency in Buildings, 2018.

BOOK CHAPTERS

- B1 Mykoniatis K. and Katsigiannis M.
"Digitalizing the Automotive Assembly Supply Chain Using Multi-Agent Based Digital Twins"
Optimizing Supply Chains Through Digital Twins: Navigating the Modern Landscape
International Series in Operations Research & Management Science, vol 375.
Springer, Cham., 2025
Editors: Ghaith Rabadi and Bulent Soykan.

PRESENTATIONS

A Multi-Agent Based Digital Twin Framework for the Digitalization of Assembly Environments

INFORMS 2025 Annual Meeting

Authors: Katsigiannis, M. and Mykoniatis, K.

Multi-Agent Based Digital Twin Architecture for Digitalizing Assembly Operations

IEEE Digital Twin Parallel Intelligence Conference (DTPI) 2025 - Workshop on Advanced Modeling and Simulation Techniques for Digital Twins

Authors: Katsigiannis, M. and Mykoniatis, K.

Real-Time Tracking of Production in Assembly Operations Using Agent-Based Modeling and Digital Twin Techniques

2024 Winter Simulation Conference

Authors: Katsigiannis, M. and Mykoniatis, K.

Digitalizing Assembly Operations Using Simulation and Digital Twins

Graduate Engineering Research Showcase: Pursuing the Space Frontier

Auburn University Research and Innovation Campus - Huntsville, AL

Author: Katsigiannis, M.

Enhancing Industrial IoT with Edge Computing and Computer Vision: An Analog Gauge Visual Digitalization Approach

North American Manufacturing Research Conference 2024 (NAMRC 52)

Authors: Katsigiannis, M. and Mykoniatis, K.

Traditional and Collaborative Robots: Levels of Implementation and Safety Aspects

Industry 4.0 Workshop (February 2024)

Participating Organizations: Interdisciplinary Center for Advanced Manufacturing Systems, The University of Alabama in Huntsville, AIDT Maritime Training Center, Alabama Modernization Program

Presenters: Katsigiannis, M. and Pantelidakis, M.

Traditional and Collaborative Robots: Levels of Implementation and Safety Aspects

Industry 4.0 Workshop for Manufacturers (June 2023)

Participating Organizations: Interdisciplinary Center for Advanced Manufacturing Systems, Alabama Automotive Manufacturers Association

Presenters: Katsigiannis, M., Pantelidakis, M., Mykoniatis, K.

Current Monitoring for a Fused Filament Fabrication Additive Manufacturing Process Using an Internet of Things System

North American Manufacturing Research Conference 2023 (NAMRC 51)

Authors: Katsigiannis, M., Pantelidakis, M., Mykoniatis, K., Purdy, G.

A Hybrid Simulation Study For Assessing Lean Manufacturing Techniques In A Lego Car Manufacturing Facility

INFORMS 2021 Annual Meeting

Authors: Katsigiannis, M., Pantelidakis, M., Mykoniatis, K.

RESEARCH PROJECTS

Title: Demonstrating Digital Manufacturing in Assembly Operations

Years: 2023 - 2026

Funding Body: US Army from the Industrial Base Analysis & Sustainment Program of the Industrial Base Policy Office of the Secretary of Defense.

Research Center: Interdisciplinary Center for Advanced Manufacturing Systems (ICAMS)

Description: Transformation of the Industrial and Systems Engineering department at Auburn University Tiger Motors lab into a Smart Visual Factory with advanced digitalization capabilities, to utilize it as a showcase of modern Industry 4.0 practices.

Title: Data and Sensing Research Group

Years: 2021 - 2024

Funding Body: US Army from the Industrial Base Analysis & Sustainment Program of the Industrial Base Policy Office of the Secretary of Defense.

Research Center: Interdisciplinary Center for Advanced Manufacturing Systems (ICAMS)

Description: Research and development of sensing applications to assist Small and Medium Manufacturers in integrating Industry 4.0 technologies in their manufacturing floors.

Title: A Simulation Project for the Steelcase Manufacturing Plant in Athens, AL

Year: 2022

Funding Body: Steelcase

Investigator: Konstantinos Mykoniatis

Description: Design, development, and implementation of a Discrete-Event Simulation model of the Steelcase Inc. plant in Athens, AL.

Title: Epic Unreal Lego Lab Project

Year: 2021

Funding Body: Epic Games through the Epic MegaGrants program

Investigator: Konstantinos Mykoniatis

Description: This project aims to help students learn by utilizing Augmented Reality technologies and the capabilities of the Unreal Engine.

Title: Customer-controlled, price-mediated, automated demand response for commercial buildings

Years: 2016 - 2019

Funding body: California Energy Commission (CEC, USA)

Investigator: Therese Pepper

Description: A CEC-supported, multi-million dollar, collaborative research endeavor with the aim to improve energy efficiency via enabling customer-controlled, price-mediated, automated demand response in residential and commercial buildings.

Title: An open-source, open-architecture software platform for plug-in electric vehicle smart charging in California residential and small commercial settings

Years: 2016-2019

Funding body: California Energy Commission (CEC, USA)

Investigator: Timothy Lipman

Description: A multi-million dollar, collaborative research project with the mission to enable advanced plug-in electric vehicle charging control in residential and small commercial settings via an open-source and open-architecture communication and control platform.

RESEARCH APPOINTMENTS

2021 - 2026: Graduate Research Assistant

Interdisciplinary Center for Advanced Manufacturing Systems

Department of Industrial and Systems Engineering,

Samuel Ginn College of Engineering, Auburn University

TEACHING APPOINTMENTS

- 2025:** **Invited Lecturer**
INSY 3420 Simulation
5 Lectures
Department of Industrial and Systems Engineering,
Samuel Ginn College of Engineering, Auburn University
- 2025:** **Co-Instructor**
INSY 5870/6870 Interactive Sensing Systems
Department of Industrial and Systems Engineering,
Samuel Ginn College of Engineering, Auburn University
- 2024:** **Co-Instructor**
INSY 5400/6400 Multi-Paradigm Modeling and Simulation
Department of Industrial and Systems Engineering,
Samuel Ginn College of Engineering, Auburn University
- 2021 - 2024:** **Graduate Teaching Assistant**
INSY 3420 Simulation and INSY 3800 Manufacturing Systems I courses.
Department of Industrial and Systems Engineering,
Samuel Ginn College of Engineering, Auburn University

INDUSTRY EXPERIENCE

- 2017 - 2019:** **Software Engineer**
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TECHNICAL SKILLS

Programming Languages: Python, Java, R, C, C#, SQL, G-code

Tools: AnyLogic, Simio, RoboDK, Universal Robots, Omron Automation Suite, Postgresql, MongoDB, LM Studio, Ollama, REST API, InfluxDB, Node-RED, Grafana, OpenCV

CERTIFICATIONS

- 2021 :** **Certificate in Mechatronics**
Southern Union State Community College
Attended the Introduction to Precision Machining, Fundamentals of Hydraulics and Pneumatics, Introduction to Programmable Logic Controllers, and Introduction to Robotic Programming courses

PROFESSIONAL DEVELOPMENT

2021 - Present	INFORMS Member
2022 - 2026:	INFORMS Auburn University Student Chapter Member (2022 - 2026) Webmaster (2024 - 2025) E-Council Representative (2025 - 2026)
2021 - 2025:	Advanced Manufacturing Research Group Auburn University Organization Committee, Presenter, and Member
2023:	Southern Automotive Conference 2023 Exhibitor with the Auburn University ISE department and Attendee
2020:	RIPCON Conference 2020 Attendee
2019:	Oπe\ n Conference 2019 Attendee

ACADEMIC SERVICE

2025:	Reviewer Measurement Journal
2025:	Reviewer Information and Software Technology Journal
2025:	Reviewer 28th European Conference on Artificial Intelligence
2025:	Auburn Engineering's 2025 Engineering Research Symposium Performed Interactive Demonstrations Using a UR5 Collaborative Robot to Industry and Academia Professionals
2024 - 2026:	Tiger Motors Lean Education Center Steering Committee Member
2023-2025:	Auburn University E-Day In-booth Demonstrations using RoboDK and a UR 5 Collaborative Robot
2022 - 2026:	Assisting Undergraduate Research in creating an InMoov Humanoid Robot Mentor
2016 - 2017:	TIE Lab Augmented Reality Team Volunteer
2014:	Technical University of Crete Microprocessor Hardware Lab, "Advanced Digital Design" course Volunteer Lab Assistant