



DSCD Newsletter Winter 2024 Issue

December 02, 2024

IN THIS ISSUE

Editor's Note

Dear Colleagues,

Welcome to the Winter 2024 issue of the ASME DSCD Newsletter! We hope this message finds all members of our dynamic systems and control community in great health and high spirits. This issue is packed with exciting updates, news highlights, and valuable opportunities.

This issue opens with the ASME DSCD Chair's Message on Page 1, reflecting on recent milestones and sharing a vision for the future.

On Page 2, our Featured Article, "Human-Centric Personalization of Ground Vehicle Control and Automation Systems," explores advancements and their transformative potential in transportation.

The Highlighted Achievements section celebrates our members' remarkable accomplishments. Don't miss the Interview with Recently Elevated ASME/IEEE Fellows, offering inspiration and insights from leaders shaping the field.

In Cross-Area Angles, we highlight efforts bridging academia and industry to foster collaboration and innovation. The New Faces Spotlights section showcases the aspirations of emerging leaders in our community.

The Upcoming Events and Conferences section provides a detailed list of opportunities to connect and engage, and the Openings section highlights career and collaboration opportunities.

We hope all DSCD members had a happy and productive winter in 2024. Thank you for your continued support of the DSCD Newsletter. We look forward to your future submissions and continued engagement.

Best Regards,

Editor: Shu-Xia Tang, Texas Tech University

Associate Editor: Minghui Zheng, Texas A & M University

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ASME DSCD Chair's Message

Marcia O'Malley, Rice University

I am delighted to share updates on recent developments and the future perspectives of our division as the Chair of the Executive Committee (ExComm) for the ASME Dynamic Systems and Control Division (DSCD). First, the Executive Committee welcomed new members in the summer of 2024. Kam Leang joined as the Junior Member, and Diane Peters joined as Treasurer. ExComm's focus in 2024 has been implementing our strategic plan that was developed under the leadership of prior chairs. The plan outlines five pivotal areas for advancing the Division: (1) membership growth and retention; (2) heightened impact and visibility of Division-sponsored journals and conferences; (3) enhanced productivity of technical committees; (4) commitment to diversity, equity, and inclusion (DEI); and (5) increased engagement with industry. This year, we are focusing on activities that will drive us towards these goals, and over the next several years, we will collaborate closely with DSCD members and ASME TEC to diligently monitor and report on our progress. We recently gathered at the 2024 Modeling, Estimation, and Control Conference (MECC) held in October in Chicago, Illinois. Several division awards were presented at the annual awards ceremony, including the Henry M. Paynter Outstanding Investigator Award, the Michael J. Rabins Leadership Award, the Rudolf Kalman Best Paper Award, and the Rufus Oldenburger Medal. We also had the pleasure of hearing from the 2024 Nyquist Lecturer, Anna Stefanopoulou. At MECC, we also

recognized past division chair Jinggang Yi among many other DSCD volunteers. There are many ways to contribute to the Division, and I encourage you to consider volunteering at any level to contribute to the Division's success. Division meetings take place at ACC and MECC each year, and are a great way to learn about our activities, publications, and conferences, and to network with other members. DSCD is a vibrant community, as evidenced by the strong attendance at MECC, several active technical committees, and growing student membership. Conference attendance at MECC was up compared to prior years, and indicates our desire as a community to meet in person to share research and provide quality programming for members. Our technical committees drive member engagement, organizing special sessions and recognizing the accomplishments of members through paper awards. The Division is committed to nurturing the next wave of talent. We continue to see strong growth trends in our student membership year on year. The Division remains committed to supporting initiatives aimed at engaging students and young researchers. As you plan for the coming year, please consider submitting your manuscripts to our flagship journals. Several of these journals welcomed new leadership this year. Anna Stefanopoulou is now Editor-in-Chief for the ASME Journal of Dynamic Systems, Measurement and Control, and Qian Wang is now Editor-in-Chief of the ASME Letters in Dynamic Systems and Control. These pub-

lications rely on strong submissions from our membership, and timely and quality reviews as well. I invite your active participation in our sponsored events for 2025. The 2025 American Control Conference (ACC) will be held Tuesday through Thursday, July 8-10, 2025, in Denver Colorado. The 2025 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM2025) is set to be held on July 14-18, 2025 in Hangzhou, China. The 2025 Modeling, Estimation, and Control Conference (MECC) will take place from October 5 through 7 in Pittsburgh, Pennsylvania. Many conferences in our research community now follow a joint concurrent submission model with high-impact journals. AIM will again feature concurrent submissions with the IEEE/ASME Transactions on Mechatronics, a flagship journal co-sponsored by the Division. Additionally, the 2025 MECC will offer concurrent submission options with the ASME Journal of Dynamic Systems, Measurement and Control, ASME Letters in Dynamic Systems and Control, and the Journal of Autonomous Vehicles and Systems, all sponsored by the Division. As we reflect on our accomplishments in 2024 and look towards a new year, I am grateful to all of our dedicated members who volunteer for Division activities and events, enabling us to continually grow and serve our community. I wish each of you a joyful and healthy holiday season and a new year filled with promise and opportunity.

Editorial Board

The Dynamic Systems and Control Division Newsletter is published twice annually (Summer & Winter) to the Division's email list. Please submit your items for publication by e-mail to the editorial team. Editor: Shu-Xia Tang, Texas Tech University, shuxia.tang@ttu.edu. Associate Editor: Minghui Zheng, Texas A&M University, mhzheng@tamu.edu.

Cover image courtesy: <https://thinkml.ai/>.

Human-Centric Personalization of Ground Vehicle Control and Automation Systems

Junmin Wang

Walker Department of Mechanical Engineering
University of Texas at Austin

Abstract Through over a century of continual engineering refinement, ground vehicles have become and will remain integral to society due to their ubiquitous interaction with humans and significant impact on energy, the environment, roadway safety, and daily life. Advances in computing and communication technologies have inaugurated a transformative era in ground mobility, presenting unprecedented opportunities to address persistent challenges in transportation. This article highlights several recent advancements in human-centric machine intelligence, emphasizing its critical role in enhancing individual vehicle performance during real-world operations.

Introduction

Ultimately, vehicles are designed to serve humans, who exhibit diverse characteristics, usages, and preferences. Modern vehicles incorporate continuous technological advancements, whose effectiveness depends on how well they understand, collaborate with, and adapt to individual human users in real-world scenarios. Despite substantial investments in improving vehicle systems, optimizing their personalization for individual users remains an area that demands attention. The following sections briefly explore some learning-based approaches to vehicle automation and control system personalization. These methods harness recent technological disruptions—connectivity, automation, and electrification—to transform vehicles into intelligent and trustworthy machines capable of learning, adapting, and working optimally with individual human users, thereby improving driving safety, efficiency, and mobility in real-world operations, as Fig. 1

shows.

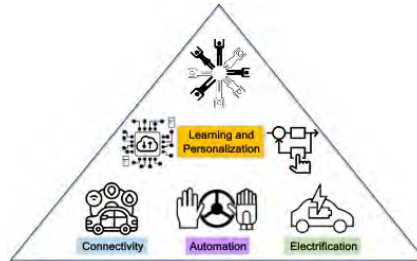


Figure 1: Illustration of human-centric vehicle automation and control.

Connectivity

Advances in communication technologies allow vehicles to exchange information with a vast network of entities, offering unprecedented data richness and opportunities to enhance vehicle performance. For instance, daily driving data made available by connectivity can reveal frequent routes and their road or traffic characteristics for individual vehicles. This knowledge may improve future vehicle power and speed predictions and thus enable predictive control of vehicle propulsion systems, as constrained dynamic systems, to enhance vehicle energy efficiency. The framework proposed in [1] exemplifies this concept, demonstrating how learning from historical driving data can enable predictive, personalized energy management in hybrid electric vehicles, significantly improving their real-world energy efficiency.

Automation

The increasing automation and autonomous capabilities of vehicles have captured significant attention from researchers and end-users alike. Given the diversity among human users, it is crucial for vehicle automation systems to learn from and adapt to individual

drivers, moving beyond one-size-fits-all solutions. Connectivity-driven access to historical driving data facilitates the learning of individual driving and cognitive characteristics. This knowledge may enable automation systems to tailor their algorithms, enhancing performance and building trust with human users. For example, the study in [2] showcases models capable of learning individual drivers' steering characteristics from daily operations, predicting their steering behavior during emergency maneuvers. Subsequently, vehicle motion control methods such as [3] integrate vehicle dynamics and human steering behaviors to deliver personalized driving assistance, substantially enhancing the likelihood of collision avoidance in safety critical situations.

Electrification

Electrification of vehicle propulsion systems has proven effective in enhancing energy efficiency and environmental sustainability. However, electric vehicle (EV) range anxiety—stemming from limited battery capacity and sparse charging infrastructure—remains a major concern for users. Reliable predictions of EV battery energy consumption for planned routes can help alleviate this concern. As route selection, road features, and driving behavior significantly impact EV energy consumption, analyzing daily driving data can provide valuable insights. The method introduced in [4] uses data-driven approaches to predict future EV speeds and energy consumption based on road characteristics and individual driving behaviors, offering users greater confidence before starting their trips, thus elevating individuals' trust in and adoption on EVs.

Outlook

While mechanical systems had been the focus in ground vehicle research, recent technological disruptions have significantly changed the landscape of ground mobility research into a multidisciplinary field where dynamic systems and control will continue to play a pivotal and critical role in shaping future ground mobility systems, driving innovation in human-centric personalization and vehicle intelligence.

References

1. Zeng, X. and Wang, J. (2015) A Parallel Hybrid Electric Vehicle Energy Management Strategy using Stochastic Model Predictive Control with Road Grade Preview, *IEEE Transactions on Control Systems Technology*, 23(6), 2416-2423.
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3. Zhou, X., Shen, H., Wang, Z., Ahn, H., and Wang, J. (2023) Driver-Centric Lane-

Keeping Assistance System Design: A Non-Certainty-Equivalent Neuro-Adaptive Control Approach, *IEEE/ASME Transactions on Mechatronics*, 28(6), 3017 – 3028.

4. Shen, H., Zhou, X., Ahn, H., Lamantia, M., Chen, P., and Wang, J. (2023) Personalized Velocity and Energy Prediction for Electric Vehicles with Road Features in Consideration, *IEEE Transactions on Transportation Electrification*, 19(3), 3958 – 3969.

Bio



Junmin Wang is a Professor and holds the Fletcher Stuckey Pratt Chair in Engineering in the Walker Department of Mechanical Engineering at University of Texas at Austin. He has a wide range of research interests covering control, modeling, estimation, opti-

mization, diagnosis, and AI for dynamical systems, especially for automotive, sustainable mobility, robotics, human-centric automation, and cyber-physical system applications. Dr. Wang is the author or co-author of more than 400 peer-reviewed publications including 201 journal articles and 13 U.S. patents. Professor Wang is an Elected Voting Member on the Executive Committee of ASME Dynamic Systems and Control Division, has served as General Chair of 2023 IEEE International Automated Vehicle Validation Conference, General Chair of 2021 (inaugural) Modeling, Estimation and Control Conference, a Senior Editor, Editor, Technical Editor, or Associate Editor for over 10 journals. He is a recipient of numerous honors and awards including 2024 ASME Charles Stark Draper Innovative Practice Award, 2019 IEEE Best Vehicular Electronics Paper Award, 2018 IEEE Andrew Sage Best Transactions Paper Award, 2017 IEEE Transactions on Fuzzy Systems Outstanding Paper Award, 2012 NSF-CAREER Award, 2011 SAE International Vincent Bendix Automotive Electronics Engineering Award, and 2009 ONR-YIP Award. Prof. Wang is a Fulbright Distinguished Scholar, SAE Fellow, ASME Fellow, and IEEE Fellow.

Mobility Systems Lab at UT Austin

Junmin Wang Research Group



Chair's Words of ACC2024

Martha A. Grover

The American Control Conference was held in Toronto, Ontario, Canada on July 8-12, 2024 at the Westin Harbour Castle. The purpose of this annual conference is to bring together researchers and practitioners in the controls community to share their ideas and findings. Engagement of students and young professionals was a priority for the conference, including a student networking session, several special sessions, and the self-driving car student competition by Quanser. The operating committee was also assisted by the Student Advisory Committee in organizing the conference. In total there were 1363 registrants at the conference, including 415 students. There were 46 countries represented at the conference.



Figure 2: Self-driving car student competition.

Technical Program: 1391 papers were submitted to the conference, with 863 accepted for the conference proceedings and associated oral presentations. Papers were presented in two formats: rapid interactive sessions in the morning and traditional presentations in the afternoon. In addition, the program also included 34 invited sessions, 2 tutorial sessions, 20 special sessions, and 43 Late-Breaking News posters. Four plenary sessions started each day: by Kingsley Fregene (Lockhead Martin), Domitilla Del Vecchio (Massachusetts Institute of

Technology), Jorge Poveda (University of California San Diego), and Francesco Borelli (University of California Berkeley), and video recordings are available.



Figure 3: Discussions at a rapid-interactive session.

Workshops: Twelve workshops were held on July 8-9 prior to the main conference on July 10-12. All workshops were fully in person and included both half-day and full-day workshops.

Awards: Four individual awards were presented at the Awards Ceremony, plus two Hugo Schuck Best Paper Awards and the Student Best Paper Award. Naomi Leonard of Princeton University delivered remarks as the Bellman Heritage Award Winner.



Figure 4: AACC Award Winners at the Awards Ceremony.

Social Events: The conference featured many opportunities to network and to reconnect with old friends, with plenty of good food

and drink. The Thursday evening banquet at the Royal Ontario Museum was a highlight of the week.



Figure 5: Banquet at the Royal Ontario Museum.

Acknowledgements: The organizers and operating committee appreciate the contributions of our sponsors and exhibitors, the student advisory committee, the student volunteers, and all conference participants for an engaging and enjoyable conference experience.

Next Conference in the Series: The 2025 American Control Conference will be held in Denver Colorado on July 7-10: <https://acc2025.a2c2.org/>



Figure 6: 2024 ACC OpComm: Geir Dullerud, Karen Rudie, Martha Grover, Kam Leang, Stephen Smith. Not pictured: Dennis Williams, Hugh Liu, Luis Ricardez-Sandoval, Steve Ulrich, Tuhin Das, Afef Fekih, Victor Zavala, Elisa Franco, Ali Mesba, Xun Tang.

AIM 2024 Workshop: Future of Work in the Age of Robotics and AI

Minghui Zheng, Texas A&M University, College Station, TX 77843

While robotics and AI are rapidly changing the landscape of jobs and work, there are numerous obstacles to overcome in order to establish new industries and job roles, all while striving to improve productivity and the overall quality of work life. To bring together individuals involved in robotics across various sectors, the workshop on the “Future of Work in the Age of Robotics and AI” was organized and held at the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM) conference on July 15th, 2024, in Boston, MA.

This year, we had nine distinguished speakers (listed below) and welcomed approximately 100 in-person participants. We also have an interactive poster session involving students working in related areas to discuss their recent studies and projects. The topics covered human-robot collaboration, motion planning and control, and artificial intelligence. We discussed how robotics and AI will impact future work and the workforce of tomorrow across industries such as manufacturing, construction, transportation, warehousing, and more.

This workshop was organized by Minghui Zheng (Texas A&M University), Hao Su (North Carolina State University), Tan Chen (Michigan Technological University), Ellen Mazumdar (Georgia Institute of Technology), and Jingang Yi (Rutgers University). We look forward to the next workshop!

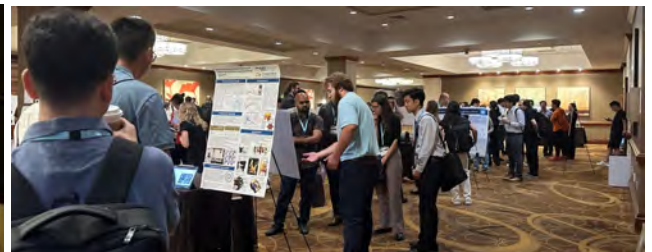


Speakers

Ben Armstrong (MIT)
Jingang Yi (Rutgers)
Taskin Padiir
Jonathon E. Slightam (SNL)
Ellen Mazumdar (Georgia Tech)
Hao Su (ncsu)
Yufeng (Kevin) Chen (MIT)
Kamal Youcef-Toumi (MIT)
Jordan M. Berg (NSF)

Talks

Why Automation Fails: Barriers to Robot Adoption in Manufacturing.
Wearable Safety Sensing and Knee Assistive Exoskeletons for Construction Workers.
Experiential Robotics for Accelerating the Future of Work.
Data-driven and Physics Informed AI approaches for Manipulation.
Additive Manufacturing for Electromagnetic Actuators and Mechatronic Systems.
AI-Powered Soft Wearable Robots for Augmenting and Restoring Human Performance.
Muscle-like Soft Actuators for Human-robot Interaction.
AI or Human Brain: Who will lead the future of Intelligence?
Robots in the Workplace: The NSF After Sunset.



ASME Letters in Dynamic Systems and Control - Recent Updates

Qian Wang, Editor-in-Chief, ASME Letters in Dynamic Systems and Control

Since its first issue in January 2021, *ASME Letters in Dynamic Systems and Control* (ALDSC) has published a total of 16 issues and 130 papers. It was a great honor for me to start my term as the Editor-in-Chief on September 1, 2024, after the founding Editor Dr. Peter Meckl retired from this position. I would like to take this opportunity to thank Dr. Meckl for his pioneering work and leadership during his term. Dr. Meckl

initiated the joint-paper submission, first with the ASME Dynamic Systems and Control Conference (DSCD), and then with the Modeling, Estimation, and Control Conference (MECC) since 2022. This initiative has greatly helped secure high-quality submissions to ALDSC and increased the visibility of the journal. In addition, ASME has recently launched the Conference to Journal (C2J) Initiative, enabling us to fast-track the

handling of relevant ASME conference papers to ALDSC. We will continue to work with future MECCs and ASME C2J to identify quality submissions.

With recommendations from the Editorial Board, I would like to highlight a few letter papers that were published in 2024, covering both control theory and control applications:

- P. M. Rivera-Ortiz, A. C. Frommer, and Y. Diaz-Mercado, "Contraction Analysis of Multi-Agent Control for Guaranteed Capture of a Faster Evader," <https://doi.org/10.1115/1.4065029>.
- K. Sung, C. Peck, and M. Majji, "Vision-Inertial Fusion for Enhanced Relative Navigation: Application of MEKF and Refined Template Matching for Target Identification," <https://doi.org/10.1115/1.4065935>.
- X. Zhou, H. Ahn, H. Shen, Y. Kung, and J. Wang, "Immersion and Invariance Adaptive Control Through Polynomial Adaptation," <https://doi.org/10.1115/1.4066463>.
- G. Zhao, J. Yao, C. P. Edson, and Z. Sun, "Design, Modeling and Control of a Hardware-in-the-Loop Testbed for Off-Road Vehicles," <https://doi.org/10.1115/1.4066465>.
- R. Moran, S. Bagley, S. Kasmann, R. Martin, D. Pasley, S. Trimble, J. Dianics, and P. Sopasakis, "NMPC for Collision Avoidance by Superellipsoid Separation," <https://doi.org/10.1115/1.4066388>.

The paper by Rivera-Ortiz et al. was a joint work of the Johns Hopkins University Applied Physics Lab and the Collaborative Controls and Robotics Lab at the University of Maryland. The authors studied the fast-evader problem in pursuit-evasion games and derived a verifiable condition for the selection of a sufficient number of pursuers to capture a faster evader. This work applied tools from differential games and nonlinear contraction theory.

The paper by Sung et al. was contributed by a team of researchers from the Electrical and Computer Engineering Department at Michigan State University and the Aerospace Engineering Department at Texas A&M University. The paper focused on the problem of relative navigation for proximity operations involving different types of flying robots. The authors presented a novel approach for the estimation of relative position and attitude via applying a multiplicative extended Kalman filter on the inertial measurements and 2D images. Experimental validation was also given to demonstrate the effectiveness of the proposed methods.

The paper by Zhou et al. was contributed by a team of researchers from the Mechanical Engineering Department, University of Texas at Austin. The authors developed a novel polynomial param-

eter adaptation strategy for the immersion and invariance (I&I) adaptive control design, which resulted in polynomial rate energy dissipation in contrast to the conventional quadratic rate energy dissipation.

The paper by Zhao et al. was contributed by a team of researchers from the Mechanical Engineering Department, University of Minnesota at Twin Cities. The paper presented the design, modeling, and control of a hardware-in-the-loop testbed for off-road vehicles. Iterative learning control was designed for loading torque tracking of the hydrostatic dynamometer to ensure close emulation of real-world operation scenarios.

The paper by Moran et al. was a collaborative work of Queen's University Belfast in the UK and EquipmentShare from Columbia, Missouri, US. The authors formulated real-time obstacle avoidance for heavy equipment as a nonlinear model predictive control problem, where both the vehicle and obstacles were modeled as convex superellipsoids. The effectiveness of the proposed approach was demonstrated through both simulation and experimental validation.

Currently, we are accepting submissions to the **Special Issue on Control Co-Design**, with Dr. Diane Peters serving as the Guest Editor. The special issue is ex-

pected to be published in early 2025.

Looking forward, one primary goal for my term is to continue to increase the number and quality of paper submissions, for ALDSC to become the go-to journal for rapid publication of early-stage, emerging, and groundbreaking research in dynamics and control. We are witnessing fast growth in artificial intelligence, autonomous vehicles, robotics, advanced manufacturing, energy systems, and healthcare systems, while dynamic systems and control are at the forefront of these emerging research and innovations. We encourage proposals for new Special Issues in these emerging areas. In addition to submissions from academia and national laboratories, papers on technology advancement and innovations from industrial researchers and developers are also strongly encouraged. In the meantime, we continue to welcome high-quality reviewers and invite new energetic and ambitious researchers to join our editorial board. Please do not hesitate to contact me for an Associate Editor position if you have obtained tenure in academia or hold an equivalent position in industry.

We thank you for your continued support of *ASME Letters in Dynamic Systems and Control*, and we look forward to your submissions in 2025!

Highlighted Achievements

Prof. Changliu Liu Receives the Young Investigator Award



Congratulations to Changliu Liu, who received the Young Investigator Award at the 2024 International Symposium on Flexible Automation! Dr. Liu was recognized for her significant advancements in intelligent robot control that enables safe and efficient human-robot collaborations for flexible manufacturing. innovation Click here to read Changliu's award acceptance speech delivered at the symposium on July 23.

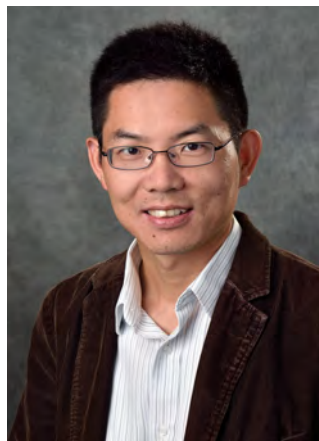
Prof. Rajesh Rajamani Receives Two Recognitions



Prof. Rajesh Rajamani is a recipient of two transportation-research-related recognitions. He has been

selected as a Distinguished Lecturer of the IEEE Intelligent Transportation Systems Society for the period September 2024 - September 2027. His research team also received AASHTO's Region 3 High Value Research Award, from the American Association of State Highway and Transportation Officials, June 2024. This award is for the team of Andre Espindola, Lee Alexander and Rajesh Rajamani for their project "Influence of Autonomous and Partially Autonomous Vehicles on Minnesota Roads". The award recognizes the nation's top research projects chosen by state DOT research directors in each of 4 AASHTO regions.

Professor Xiaobo Tan Elected Editor-in-Chief for TMECH



Xiaobo Tan, an MSU Research Foundation Professor and the Richard M. Hong Endowed Chair in Electrical and Computer Engineering at Michigan State University, has been elected the next Editor-in-Chief (EiC) for IEEE/ASME Transactions on Mechatronics (TMECH). TMECH is a leading journal in mechatronics and it is jointly sponsored by ASME Dynamic Systems and Control Division, IEEE Robotics and Automation Society, and IEEE Industrial Electronics Society. With about 3000 annual submissions, the journal ranks in the first quartile within each of the categories of

Automation and Control Systems, Electrical and Electronics Engineering, Manufacturing Engineering, and Mechanical Engineering. Tan's EiC term will start in January 2026. Tan has served the Division in several other capacities, including being a member of its Executive Committee and the general chair of the 2018 ASME Dynamic Systems and Control Conference and the 2023 American Control Conference.

Professor Diane Peters won the Society of Women Engineers Educator Award



The Society of Women Engineers Distinguished Engineering Educator award is one of SWE's Apex awards, the highest level of awards given by the Society. It recognizes women having at least 20 years of experience, with at least 10 of it in academia, having made significant contributions to engineering, engineering education, engineering technology, or science related to engineering. One of the three recipients for 2024 was Dr. Diane Peters, who was honored at SWE's conference in Chicago in October, immediately before the MECC. Diane's award citation reads: "For outstanding achievement in both technical and academic research; for embedding real-life applications in student learning; and for inspiring and empowering both women colleagues and students."

Prof. Musa Jouaneh Published two Textbooks



Professor Musa Jouaneh, from the University of Rhode Island, has recently published the second edition of his *Fundamentals of Mechatronics* textbook and its accompanying *Laboratory Exercises in Mechatronics* textbook with Cengage Learning.

This revised and updated 2nd Edition of the *Fundamentals* book focuses on fundamental concepts, applications, modeling considerations, and relevant practical issues in selecting and designing mechatronics components and systems. It includes numerous real-world examples, leveraging current manufacturers's data sheets to illustrate practical applications of theoretical concepts. The text incorporates software coding examples in both C and MATLAB.

New in the Second Edition:

- There is new coverage on Arduino microcontrollers, a new chapter on System Response, a detailed appendix on modeling mechanical systems with worked examples, and two new appendices on the Laplace Transform and standard resistor values.
- Expanded and revised content across numerous topics, particularly in chapters covering microcontrollers, control software, sensors, actuators, and control systems.
- More emphasis on operating principles and application considerations and less emphasis on coding. Coverage of Visual Basic has been removed from text.

- The addition of four integrated case studies, woven throughout the book, that address the design, modeling, simulation, control, and implementation of mechatronic systems.

- A significant increase in end-of-chapter problems, tripling the number to over 320, doubling worked examples from 46 to 92, and increasing end-of-chapter questions from 135 to 215.

- The incorporation of video links for nearly every topic covered in the text that is available via the book's companion site.

- A separate laboratory book, *Laboratory Exercises in Mechatronics*, details several laboratory exercises and projects to facilitate guided hands-on experience with many topics covered in this text.

Professor Qiang (Jason) Zhang published a Book Chapter

A book chapter "Closing the Loop Between Wearable Robots and Machine Learning: A New Paradigm for Steering Assistance Personalization Control" has been recently published in the book "Discovering the Frontiers of Human-Robot Interaction".

Lower-extremity wearable robotic devices, first introduced in the early 2000s, have been developed to enhance human mobility and support therapeutic training for patients. Recent advancements in human-in-the-loop (HIL) optimization have significantly improved the control of these devices, fine-tuning the interaction between humans and robots. This has led to more personalized assistance for daily living activities and rehabilitation training. Our comprehensive and extensive literature review, spanning from January 2017 to December 2023, highlights 34 noteworthy studies that have demonstrated enhanced human locomotion perfor-

mance through HIL-optimized and personalized assistance. This review explores pivotal innovations and methodologies for controlling lower-extremity robotic exoskeletons, exosuits, and prostheses. It covers the establishment of control objectives, the application of various optimization methods, and the assessment of outcomes. Additionally, we provide a comparative analysis of the HIL optimization method against alternative control strategies, such as those based on reinforcement learning. Looking forward, we discuss expected trends that aim to enhance the efficacy of wearable robotic devices. We also recognize the challenges that need to be addressed to fully realize the benefits of customized gait assistance for individuals with lower-extremity impairments or neurological conditions. This includes technological, regulatory, and user-centered issues that could impact the widespread adoption and effectiveness of these innovative systems.

Professor Biswanath Samanta Published a Book



Professor Biswanath Samanta has published a book titled "Introduction to Digital Control - An Integrated Approach", Springer, 2024, <https://link.springer.com/book/10.1007/978-3-031-66830-2>.

Interview with Recently Elevated ASME/IEEE Fellows

Prashant Girdharilal Mehta



Bio: Prashant G. Mehta received the Ph.D. degree in Applied Mathematics from Cornell University, Ithaca, NY, in 2004. He is a Professor of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign. He was the co-founder and the Chief Science Officer of the startup Rithmio whose gesture recognition technology was acquired by Bosch Sensortec in 2017. Prior to joining Illinois, he was a Research Engineer at the United Technologies Research Center (UTRC). He received the Outstanding Achievement Award at UTRC for his contributions to the modeling and control of combustion instabilities in jet-engines. His students received the Best Student Paper Awards at the IEEE Conference on Decision and Control 2007, 2009 and 2019, and were finalists for these awards in 2010 and 2012. In the past, he has served on the editorial boards of the ASME Journal of Dynamic Systems, Measurement, and Control (JDSMC), and the Systems and Control Letters (SCL). He currently serves as a member of the IEEE Control Systems Society (CSS) Awards Board and as an Associate Editor for the IEEE Transactions on Automatic Control (2019-present). He is a Fellow of ASME and IEEE.

Q: Congratulations on your recent elevation to ASME/IEEE Fellow. Could you please share with our readers what this

achievement means to you personally and professionally?

A: Thank you for your kind words. Being named a Fellow of both ASME and IEEE is an honor and a significant milestone in my professional journey.

More than anything, I feel incredibly privileged to have had the opportunity to contribute to the field and to work alongside so many wonderful students, colleagues, and mentors throughout my career.

Q: What do you consider to be your most significant research contributions to the field, and how have they impacted the community?

A: This is a challenging question for me to answer. It is not that I am reluctant to discuss my research contributions, but rather, as David Blackwell once said, "I am not interested in doing research and I never have been. I am interested in understanding, which is quite a different thing." My own research journey resonates with this perspective. I have simply sought to understand; and sometimes this process has led, by happenstance, to research contributions.

One such contribution is the Feedback Particle Filter (FPF), which was invented by my student Tao Yang in 2010. At that time, I was exploring the duality between nonlinear filtering and optimal control. While we did not resolve the dual then, our efforts led to the development of the FPF algorithm. My student Adam Tilton subsequently applied the FPF to motion sensing applications, which resulted in patents and embedded products. Over time, we also made progress on the duality question, and its resolution appears in the 2022 PhD thesis of my student Jin Won Kim at Illinois. I am confident that this deeper understanding will eventually lead to significant real-world impact, though the precise form that impact will take remains

to be seen.

Q: Can you tell us about the biggest challenges you faced during your journey to becoming a Fellow, and how you overcame them?

A: Rather than focusing on challenges, I prefer to reflect on how fortunate I have been throughout my career. I have had the privilege of collaborating with some truly amazing people, such as Andrzej Banaszuk, Prabir Barooah, Clas Jacobson, Uday Shanbhag, Sean Meyn, and Amirhossein Taghvaei, who have all become close friends. I have learned so much from each of them, and their support has been instrumental in my growth. Looking back, I feel incredibly lucky to have had the chance to learn, collaborate, and contribute to the field alongside such talented individuals.

Q: What exciting opportunities have arisen for you since becoming a Fellow, and how do you see these opportunities contributing to your future work?

A: Being part of such a distinguished group of Fellows means having a unique platform to engage more meaningfully with the broader engineering and academic communities. I have been fortunate to give back to the community through roles such as serving on journal editorial boards and committees for awarding best papers. The Fellow recognition motivates me to continue mentoring and teaching and helping shape the future of our discipline.

Q: What suggestions would you offer to aspiring researchers who wish to navigate their career towards becoming a Fellow?

My primary suggestion to young researchers is simple: focus on your work and the people around you. Success and recognition will naturally follow when you prioritize scholarship and meaningful collaborations.

Changzhi Li



Bio: Dr. Changzhi Li received the B.S. degree in electrical engineering from Zhejiang University, China, in 2004, and the Ph.D. degree in electrical engineering from the University of Florida, Gainesville, FL, in 2009. He is the Associate Dean of Research in the Edward E. Whitacre Jr. College of Engineering and Professor in the Department of Electrical & Computer Engineering at Texas Tech University. His research interest is microwave/millimeter-wave sensing for healthcare, security, energy efficiency, structural monitoring, and human-machine interface.

Dr. Li is an IEEE Microwave Theory and Techniques Society (MTT-S) Distinguished Microwave Lecturer, in the Tatsuo Itoh class of 2022-2024. He was a recipient of the IEEE MTT-S Outstanding Young Engineer Award, the IEEE Sensors Council Early Career Technical Achievement Award, the ASEE Frederick Emmons Terman Award, the IEEE-HKN Outstanding Young Professional Award, and the NSF Faculty Early CAREER Award. He is a Fellow of the IEEE and a Fellow of the National Academy of Inventors (NAI).

Q: Congratulations on your recent elevation to ASME/IEEE Fellow. Could you please share with our readers what this

achievement means to you personally and professionally?

A: The election to IEEE Fellow is a recognition of my contributions to the field of electrical engineering, both in technical achievements and professional service. It opens new opportunities for collaboration and serves as an inspiration for my students to pursue careers in this attractive field.

Q: What do you consider to be your most significant research contributions to the field, and how have they impacted the community?

A: My research focuses on portable radar sensor technologies that advance healthcare, smart living, structural monitoring, and wireless human-machine interfaces. The wireless sensing technologies I develop enable the monitoring of individuals' wellbeing and activities without the need for on-body devices, offering significant benefits to both urban and rural communities. Additionally, by remotely monitoring human activities and structural conditions, these technologies enhance energy efficiency and strengthen infrastructure resilience.

Q: Can you tell us about the biggest challenges you faced during your journey to becoming a Fellow, and how you overcame them?

A: The biggest challenge I faced was gathering verifiable evidence to demonstrate the impact of my technical contributions. To address this, I worked closely with my research group to publish in the flagship journals and conferences of my technical society within IEEE. To further extend the reach of my work, I served as a Distinguished Lecturer for my society, delivering over 35 talks in the past two years to 45 chapters across countries including India, China, Latvia, Croatia, Australia, Taiwan, the US, Sri Lanka, Poland, Portugal, Tunisia, Singapore, Pakistan, Belgium, Austria, Egypt, Italy, and Mexico. In addition, I filed multiple patents and collaborated with en-

trepreneurs on technology transfer, leading to the licensing of intellectual property and the acquisition of a startup based on my technology.

Q: What exciting opportunities have arisen for you since becoming a Fellow, and how do you see these opportunities contributing to your future work?

A: Becoming an IEEE Fellow enhances the visibility of my research program and opens opportunities to connect with researchers both within my field and across other disciplines that could benefit from collaboration. For example, it has enabled me to partner with leading experts to apply wireless sensing technologies to dynamic systems and control for structural health monitoring in wind farms, thereby expanding my research portfolio to include energy system resilience.

Q: What suggestions would you offer to aspiring researchers who wish to navigate their career towards becoming an ASME/IEEE Fellow?

A: To be considered for IEEE Fellow, a nominee must first be an IEEE Senior or Life Senior Member and have been an IEEE member for at least five years preceding the year of elevation. I strongly encourage interested colleagues to pursue IEEE Senior Member status, as the nomination process is straightforward, and I would be happy to share my experiences with this important first step. For elevation to Fellow, a nominee must identify two major technical contributions to their field and provide verifiable evidence that demonstrates the significant impact of those contributions on society. Therefore, I advise aspiring colleagues to focus on developing unique technical innovations and expanding their impact on society to strengthen their case for Fellow nomination.

Q. Thank you for your sharing!

A: Thank you for the opportunity and for the great work with the Newsletter.

Cross-Area Angles: Bridging Academia and Industry

Diane Peters



Bio: Diane L. Peters, Ph.D., P.E., F.SWE, worked in industry for thirteen years prior to her doctorate, primarily doing machine design. After receiving her Ph.D. from the University of Michigan, she briefly worked for LMS International/Siemens, then joined the faculty of Kettering University. She is currently an Associate Professor of Mechanical Engineering at Kettering, with her teaching and research focusing on dynamic systems. She is an active member of many organizations including ASME and the Society of Women Engineers (SWE).

Q: Congratulations on successfully transitioning between industry and academia. Could you please share your experience with our readers?

A: Thank you. My transition from industry to academia was a little different than what some people have done – although I certainly am not the only one who's followed my pathway! I started out as an engineer in industry with a bachelor's degree, and my job there was very focused on product design. I spent 13 years doing that kind of work, earning a master's degree as a part-time student along the way. I also, during that time, started teaching in the

evening at a community college, and discovered both that I liked doing that and that I was pretty good at it. So, when I decided to make a change in my career path, it was into academia. I left industry and moved, enrolled in a Ph.D. program and got a doctorate in mechanical engineering, and then – after another brief industry position – went into academia with a faculty position at Kettering University.

Q: What are the biggest challenges you faced during this transition?

A: One of the challenges I faced was in transitioning my writing style from a more industry-focused style to writing academic articles. If you look at the type of writing you do in industry, it really can look very different from a paper that you might write as an academic, and it took a while to learn new habits. There are probably still traces of that industry time in my writing, but I've obviously learned how to adapt, since I've been able to publish quite a few papers. In the Ph.D. itself, I had to refresh my memory on a lot of things that I hadn't used lately; there were some things that I knew inside out, since I had worked with them, but some of the formal mathematics was a little hazy. Another big challenge was the fact that I have a more generalist outlook, especially since I worked at small companies where I might be doing everything from initial concept design all the way through final design and supporting the shop as they assembled the product. This kind of contrasts with the specialized focus that researchers tend to have and has led to me having a research agenda that has multiple different threads – and they can be VERY different!

Q: What are the most exciting opportunities in transitioning between industry and academia?

A: One of the exciting things, though, is the fact that I do “get” industry in a way that I wouldn't without having worked there. Of course industry is very diverse and changes over time, so I don't claim that I know everything about it, but it give me an understanding of things in that world that I wouldn't otherwise have, which is very useful in a co-op university like Kettering. It also influences how I teach, with industry stories and practical implications coming in frequently when I make up my lectures.

Q: What suggestions would you offer to others navigating a similar transition?

A: The biggest thing I would suggest to someone else who wants to follow my path is first to develop a support network for the Ph.D. Anyone who's gotten it knows it's a challenge, and it can be more of a challenge when you feel like you're so different from classmates, whether because of age or experience or anything else. Having supportive people in your life is important. Second, if you want to go into academia, develop a good storyline for how you're coming to this point, and what your past industry knowledge adds to your capabilities as a teacher and a researcher. This story is going to be different from that of someone who got a doctorate and then spent time doing industry research, which is fine – there's room for lots of diversity among faculty – but it may take a little more work to explain it in a form that people understand.

Q. Thank you for your sharing!

A: Thank you for the opportunity.

New Faces Spotlights

Maria Laura Delle Monache



Dr. Maria Laura Delle Monache is an assistant professor in the Department of Civil and Environmental Engineering at the University of California, Berkeley. Prior to joining the faculty at UC Berkeley, she was a research scientist at Inria in Grenoble, France (2016-2021) and a Postdoctoral fellow at Rutgers University - Camden in the USA (2014-2016). She received her Ph.D. degree in applied mathematics from the University of Nice-Sophia Antipolis, France, in 2014, and a M.Sc. in Mathematical Engineering from the University of L'Aquila (Italy) & University of Hamburg (Germany), and a B.Sc. in Industrial Engineering from the University of L'Aquila (Italy).

She is a member of the IEEE Control Systems Society (CSS) Technical Committee on smart cities and of the Standing Committee on Traffic Flow Theory and Characteristics of the Transportation Research Board (ACP50). She is the recipient of the 2023 IEEE Technical Committee on Cyber-Physical Systems (TCCPS) Mid-Career Award for her contributions to modeling and control of CPS Transportation systems and the 2023 IEEE Intelligent Transportation Systems Society (ITSS) Young researcher/Engineer award in recognition of her contributions to modeling, control, and large-scale testing of intelligent transportation systems.

Dr. Delle Monache's research

lies at the intersection of transportation engineering, mathematics, and control theory. Her research focuses on designing techniques to model and control cyber-physical transportation systems, aiming to understand the impact of new technology on traffic with a focus on sustainability and efficiency.

Fangzhou Xia



Dr. Fangzhou Xia joined the Walker Department of Mechanical Engineering (ME) at the University of Texas at Austin in August 2024. Prior to that, he was a research scientist at Massachusetts Institute of Technology (MIT), jointly appointed in the ME Department and the Physics Department, where he also conducted his postdoc training. He received his Ph.D. in 2020 and M.S. in 2017 from MIT in the ME department. He received dual bachelor's degrees in ME from the University of Michigan, Ann Arbor, and in Electrical and Computer Engineering from Shanghai Jiao Tong University in 2015. He received an ASML Student Scholarship in 2020 and the 2023 ASME DSCD Best Student Paper in Vibrations Award. As an expert in atomic force microscopy (AFM), Dr. Xia published a book in 2024 with Springer named "Active Probe Atomic Force Microscopy: A Practical Guide on Precision Instrumentation". He is a member of the DSCD Mechatronics Technical Committee.

Dr. Xia directs the MINIMAX Lab, which develops MINIaturized devices for MAXimized impacts. To be specific, his research interests include mechatronics, physical/computational intelligence, and nanorobotics for applications in precision instrumentation, medical devices and manufacturing automation. His lab currently develops magnetically guided miniaturized capsule robots as "swallowable surgeons" for diagnosis/treatment of gastrointestinal disease and nanorobotic manipulation/imaging instruments as enabling technology for semiconductor fabrication and inspection. Dr. Xia's teaching interests include dynamic system modeling and control, mechatronics, and instrumentation, with a specialty in developing education tools using digital twins and metaverse.

Justin Yim



Justin Yim joined the University of Illinois Urbana Champaign Mechanical Science and Engineering Department as an assistant professor in January 2023. He leads the Novel Mobile Robots Lab (NMbL) researching new and high-performance robot locomotion including walking and rolling as well as unconventional jumping, climbing, waddling, and more. Dr. Yim's interests include both designing new robot morphologies and developing their control. For his work in high-performance robot hopping, he received the best pa-

per award at IEEE/RSJ IROS 2017 and best student paper award at ICRA 2019.

Dr. Yim earned a B.S.E. in Mechanical Engineering and Electrical Engineering and M.S.E. in Robotics from the University of Pennsylvania and a PhD in Electrical Engineering from the University of California Berkeley. He received a postdoctoral fellowship from the Computing Research Association/Computing Community CIFellows program at the Carnegie Mellon University Mechanical Engineering Department. His hobbies include getting outdoors and collecting old laptop computers (indoors).

Chaozhe He



Chaozhe He joined the Department of Mechanical and Aerospace Engineering at the University at Buffalo as an assistant professor in January 2024. His research interests include nonlinear and optimal control, learning-based control, game theory, safe human-robot interaction & teaming. His group at UB focuses on developing safe and efficient autonomous systems, such as connected automated vehicles and robotic manipulators, that work around, with, and for the human.

Before joining UB, he spent 5 years as a research engineer at Navistar, Inc. and then Plus.ai developing planning and control algorithms for autonomous trucks. He was the principal control engineer for Navistar's DOE-funded Supertruck-II project. His work has been implemented in pro-

duction trucks and generated 7 granted U.S. patents. He received a B.S. in Applied Mathematics degree from Beihang University, Beijing, China, in 2012 and a Ph.D. degree in Mechanical Engineering from the University of Michigan, Ann Arbor, in 2018.

Qiang (Jason) Zhang



My name is Qiang (Jason) Zhang. I am an Assistant Professor (from 08/2023) in the Department of Mechanical Engineering (ME), and affiliated with the Department of Chemical Biological Engineering (ChBE) at The University of Alabama (UA). Prior to joining UA, I was an Advanced Rehabilitation Research Training Projects (ARRTs) Postdoctoral Research Fellow in the Closed-Loop Engineering for Advanced Rehabilitation (CLEAR) in the UNC/NCSU Joint Department of Biomedical Engineering at the University of North Carolina at Chapel Hill (UNC) and North Carolina State University (NCSU) from 11/2021 to 08/2023. I received Ph.D. degree in Biomedical Engineering from UNC and NCSU in 10/2023. My primary research area of expertise is Advanced Controls, Wearable Robotics and Control, Human Biomechanics, Neuromuscular Modeling and Control, and Biomedical Engineering.

In the Enhanced NeuroRobotics Autonomy and Biomechanical Engineering (ENABLE) Lab <https://enable.lab.ua.edu/> at UA, we develop robotic devices and control strategies to provide personalized assistance and overcome mobility

challenges with the fundamental goal of improving the quality of life for the aged population and people with mobility deficits, like stroke, spinal cord injury, and multiple sclerosis. We accomplish this goal by combining robotics, biomechanics, neuromuscular modeling/control, human-centered artificial intelligence, mechanical engineering, electrical engineering, computer science, and biomedical engineering to create effective and efficient systems.

Thanakorn Khamvilai



Dr. Thanakorn Khamvilai is an Assistant Professor in the Department of Mechanical Engineering at Texas Tech University, Lubbock, Texas, USA. He received his Master's and Doctoral degrees in Aerospace Engineering from the Department of Aerospace Engineering, Georgia Institute of Technology. He joined the DSCD community in 2024 and is also a member of IEEE and the American Institute of Aeronautics and Astronautics (AIAA).

Dr. Khamvilai's research interests include guidance-navigation-control of unmanned vehicles, real-time optimization, and aviation and avionics systems. His work explores novel frameworks for designing aerospace vehicle control systems, utilizing adaptive control and estimation approaches to enhance the performance of unmanned aircraft in many safety-critical applications, such as tilt-wing aircraft with tilt-

ing mechanism failure, and aircraft detect-and-avoid capabilities. This led to one of his recent papers, “*Vision-Based Localization and Autonomous Homing for UAVs*”, selected as a finalist for the Best Student Paper Award at the 2024 Digital Avionics Systems Conference.

Before joining Texas Tech, Dr. Khamvilai was an Assistant Research Professor in the Department of Aerospace Engineering at

Pennsylvania State University in State College, Pennsylvania, USA. There, he collaborated with Professor Eric Johnson and his group at the Penn State Unmanned Research Laboratory (PURL), where he served as a Co-PI on several projects, including “UAV Operations in Littoral Environments” sponsored by the US Navy, and “*ASCENT Project 77: Measurements to Support Noise Certification*

for UAS/UAM Vehicles and Identify Noise Reduction Opportunities Renewal” sponsored by the Federal Aviation Administration (FAA). He also served as a PI on his NSF I-Corps award, titled “Reconfigurable, Modular, Electric Vertical Take-Off and Landing UAV Platform”, which assessed the market feasibility of reconfiguration and modular UAVs for the civil, government, and military sectors.

Upcoming Events and Conferences

Celebrating Prof. Miroslav Krstić's 60th Birthday: CDC 2024 Workshop, “Control and Adaptation: Imagine What's Next”

With great admiration and joy, we announce the CDC 2024 workshop, “Control and Adaptation: Imagine What's Next,” celebrating the milestone 60th birthday of Professor Miroslav Krstić. This workshop will feature presentations by students and collaborators, covering topics ranging from nonlinear control, partial differential equation (PDE) control, and extremum seeking control, offering a comprehensive overview of contemporary methodologies and applications.

The event will be co-headlined by two eminent scholars, Professors Tamer Başar and Jean-Michel Coron.

Miroslav Krstić is an American control theorist and Distinguished Professor of Mechanical and Aerospace Engineering at the University of California, San Diego (UCSD). He also serves as the director of the Center for Control Systems and Dynamics at UCSD and as Senior Associate Vice Chancellor for Research. He is a co-author of 18 books, about 480 journal papers, and is the highest-published author in both of the flagship control systems journals, *Automatica* and *IEEE Transactions on Automatic Control*, with more than 100 papers in each of the two journals. Beyond his the-



oretical contributions, Krstić has also impacted technology development in extreme ultraviolet lithography in semiconductor manufacturing, advanced arresting gear on the newest aircraft carrier class Gerald Ford, the ChemCam laser-based spectroscopy on NASA Mars rover Curiosity, charged particle accelerators, oil drilling, nuclear fusion, and in Lithium-ion battery management systems. His groundbreaking work has profoundly shaped the fields of nonlinear and adaptive control, extremum seeking, PDE backstepping, predictors for nonlinear delay systems, prescribed-time control, safe and non-overshooting nonlinear control, and machine learning for PDE control. Miroslav Krstić's dedication to education is equally

remarkable, having mentored 49 PhD students and 14 postdocs, many of whom continue to advance academia and fulfill the educational mission. See biography and research of Miroslav Krstić at <https://flyingv.ucsd.edu/>.

This CDC 2024 workshop celebration provides an opportunity to reflect on his illustrious career, marked by groundbreaking achievements and profound contributions. Information about the workshop can be found at the following link: <https://www.insync-lab.org/cdc2024-session>. We warmly invite you to join this special event and celebrate the profound impact of Miroslav Krstić's work on the field of control theory.

Advanced Course

Professor Denes Takacs (TU Budapest) and Professor Gabor Orosz are organizing an Advanced Course on "The Dynamics of Rolling and Balancing in Micromobility Vehicles". More information about the course can be found at <https://cism.it/en/activities/courses/C2517/> and a flyer with the schedule is available at https://cism.it/media/filer_public/a1/76/a176da0e-5ecd-4411-a00b-0c745480d37b/c2517_orosz_takacs_.pdf.

2024 Conference on Decision and Control

Milan, Italy, Dec. 16-19, 2024

<https://cdc2024.ieeecss.org/>



8th IEEE International Conference on Industrial Cyber-Physical Systems

Emden, Germany, May 12-15, 2025

<https://icps2025.ieee-ies.org/>



5th IFAC/IEEE-CSS Workshop on Control of Systems Governed by Partial Differential Equations

Beijing, China, June 18-20, 2025

<https://cpde2025.bjut.edu.cn/>



European Control Conference 2025

Thessaloniki, Greece, June 24-27, 2025

<https://ecc25.euca-ecc.org/>



15th IFAC Workshop on Adaptive and Learning Control Systems

Mexico City, Mexico, July 2-4, 2025

<https://alcos2025.itam.mx/>



2025 American Control Conference

Denver, CO, USA, July 8-10, 2025

<https://acc2025.a2c2.org/>



2025 IEEE/ASME International Conference on Advanced Intelligent Mechatronics

Hangzhou, China, July 14-18, 2025

<https://aim2025.org/>



9th IEEE Conference on Control Technology & Applications

San Diego, CA, USA, August 25-27, 2025

<https://ccta2025.ieeecss.org/>





2025 IEEE/ASME International Conference on Advanced Intelligent Mechatronics

July 14th - 18th, 2025 | Hangzhou, China

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The 2025 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM2025) is set to be held on July 14-18, 2025 in Hangzhou, China, a city famous for its enchanting West Lake, vibrant tech environment, and rich cultural heritage. Serving as a leading conference in the field of intelligent mechatronic systems, AIM 2025 is committed to advancing diversity in the technology industry, promoting a culture of inclusion and equity, and welcoming, engaging, and rewarding all who contribute to the field and will bring together experts and researchers from around the world to exchange views on cutting-edge research outcomes and future developments. Visit <https://aim2025.org/> for more information.

The sponsors and organizers of AIM 2025 welcome submissions of original work across a wide range of topics including Sensors and Actuators, Automotive Systems, Bio-design and Manufacturing, Data Storage, Fault Diagnosis, Human-Machine Interfaces, Human-Robot Interaction/Collaboration, Human Factors in Mechatronics Systems, Industry Applications, Intelligent Systems, Machine Vision, Fluid Transmission and Control, Micro Electro-Mechanical Systems, Micro/Nano Technology, Modeling and Design, System Identification and Adaptive Control, Motion Control, Vibration and Noise Control, Neural and Fuzzy Control, Opto-Electronics and Opto-mechatronics, Real-Time and Hardware-in-the-Loop Simulation, Robotics, System design Integration, Smart Materials and Structures, Energy Harvesting, and other emerging fields. We invite high-quality submissions in the categories below. All submissions must be uploaded to the submission website: <http://ras.papercept.net/conferences/scripts/start.pl> following the schedule below.

Contributed: All papers go through a rigorous peer-review process. All accepted manuscripts must be presented by the authors at the conference, will be published in the conference proceedings, and will be submitted for inclusion in IEEEExplore, subject to formatting and copyright requirements.

Invited: Invited sessions consist of 4 to 6 thematically related invited papers that will be presented together at the conference. Invited session proposals must include a brief statement of purpose and extended abstracts of the included invited papers. Invited papers are submitted and reviewed following the same process as contributed papers, and are included in the proceedings.

Workshops: Half-day or full-day workshops will be in one of two categories: (1) *Tutorial Workshops* focused on educating attendees about an emerging topic and (2) *Research Workshops* focused on bringing together experts to discuss an emerging field. Tutorial and workshop proposals must include a statement of objectives, a description of the intended audience, and a list of speakers with an outline of their planned presentations. Unless specifically requested, individual tutorial and workshop presentations are not peer reviewed, and do not appear in the proceedings.

Special Sessions: Special sessions offer a venue for exposing attendees to new and developing research fields and discussing specialized, novel, and not strictly technical topics (such as products) that do not fit in the other submission categories. Special Session proposals must include an abstract of the special session. **Late Breaking Results:** Poster presentations on late-breaking mechatronics research results will be presented during the conference. To enable presenters to share their most current findings, take note that the deadline for posters is significantly later than the deadline for papers. Posters will be peer-reviewed.

TMECH/AIM Focused Section and TMECH Presentation-Only: There are two chances for TMECH authors to present their work at AIM2025. (1) **Presentation Only:** All authors of TMECH papers accepted between Feb. 16, 2024 and Feb. 15, 2025 may choose to present their work during the conference. (2) **Focused Section:** Papers submitted to the 6th Edition of the Focused Section on TMECH/AIM Emerging Topics will be reviewed by TMECH, and if accepted, are presented at AIM2025 and published as part of the focused section in the August 2025 issue of TMECH. Inclusion in the focused section requires paid registration and presentation. Papers rejected for publication in TMECH will automatically be considered by the Program Committee of AIM 2025 for inclusion in AIM2025 as a contributed paper. Details can be found in the supplemental call for papers on the conference website: <https://aim2025.org/> and the TMECH website <http://www.ieee-asme-mechatronics.info/>.

IMPORTANT DATES:

TMECH/AIM Focused Section:	January 1, 2025
Invited/Workshop/Special Session Proposals:	January 20, 2025
Contributed and Invited Papers and TMECH Presentation Only:	February 1, 2025
TMECH/AIM First Decision:	March 1, 2025
TMECH/AIM Revisions:	March 25, 2025
Notification of AIM and TMECH/AIM Paper Status:	May 1, 2025
Final Paper Submission:	May 10, 2025
Late-Breaking Submission:	May 16, 2025

Call for Papers

The Sixth Edition of Focused Section on TMECH/AIM Emerging Topics

Submissions are called for the Sixth Edition of Focused Section (FS) on TMECH/AIM Emerging Topics. This Focused Section is intended to expedite the publication of novel and significant research results, technology, and/or conceptual breakthroughs of emerging research topics within the scopes of TMECH (www.ieee-asme-mechatronics.info), providing rapid access to the state-of-the-art of TMECH publications to the mechatronics community.

The submitted paper must not exceed 8 TMECH published manuscript pages, excluding authors identity (photos, biography, email ids, and affiliations), and will be subject to the peer review process by TMECH standard. All final accepted papers will be published in August Issue of TMECH in 2025, and will be presented in the 2025 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2025, <http://www.aim2025.org/>). The rejected papers from the submissions will be transferred to the Program Committee of AIM 2025 for further review and consideration as conference contributed papers.

The review process for submissions to this Focused Section will be conducted in up to two rounds with one Major/Minor Revision allowed, and the final decision falls into one of the following two categories:

1. Accept for publication in Focused Section. In this case, the paper will be accepted by AIM 2025 concurrently for presentation only, with full information of the paper included in the preprinted proceeding of AIM 2025. The final publication in TMECH, however, will be subject to the completion of presentation in AIM 2025 with full registration fee paid.
2. Reject for publication in Focused Section (after the first or second round). In this case, the paper, as well as all the review comments, will be forwarded to the Program Committee of AIM 2025 for further consideration. A final Accept/Reject decision will then be made by the Committee as a conference contributed paper for AIM 2025.

Manuscript preparation

Papers must contain original contributions and be prepared in accordance with the journal standards. Instructions for authors are available online on the TMECH website.

Manuscript submission

Manuscripts should be submitted to TMECH online at: <http://mc.manuscriptcentral.com/tmech-ieee>, selecting the track "TMECH/AIM Emerging Topics." The cover letter should include the following statement: This paper is submitted to the Sixth Edition of Focused Section on TMECH/AIM Emerging Topics. The full information of the paper should be uploaded concurrently to AIM 2025 online at: <http://ras.papercept.net/conferences/scripts/start.pl>, noted with the given TMECH manuscript number in the designated area.

Submission/Review/Decision Timeline:

Opening Date of TMECH/AIM FS Submission Site (first submission):	November 1, 2024
Closing Date of TMECH/AIM FS Submission Site (first submission):	January 5, 2025
Full Information of TMECH/AIM FS Paper Submitted to AIM Site:	January 5, 2025
First Decision for TMECH/AIM FS Submission:	March 1, 2025
Revised TMECH/AIM FS Submission Due by:	March 25, 2025
Final Decision for TMECH/AIM FS Submissions:	May 1, 2025
Final Version of TMECH/AIM FS Submission Due by:	May 10, 2025
Publication of Focused Section in TMECH:	August 2025

Contacts: For any questions related to this Call for Paper, please contact:

Zongxuan Sun, zsun@umn.edu, Senior Editor of TMECH,

Jian Chen, chenj8@sustech.edu.cn, Program Co-Chair of AIM 2025.

12TH IFAC SYMPOSIUM ON INTELLIGENT AUTONOMOUS VEHICLES



IAV 2025

May 7-9, 2025 | Phoenix, Arizona, USA



CALL FOR PAPERS

IMPORTANT DATES

Draft Paper Submission

January 15, 2025

Acceptance Notification

March 15, 2025

Final Paper Submission

March 30, 2025

Venue Information

ASU Memorial Union



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The 12th IFAC Symposium on Intelligent Autonomous Vehicles (IAV 2025) will take place at Arizona State University in Phoenix, Arizona, marking the first time this prestigious event is hosted in North America. The symposium will showcase cutting-edge techniques for addressing key challenges in modeling, estimation, control, optimization, and safety, while also highlighting successful case studies and applications. Participants will explore a wide range of vehicle modalities, including land, sea, air, and space, as well as multi-vehicle systems, such as swarms and networked platoons, alongside individual vehicles and mobile robotics. Given the recent rise of robotaxis like Waymo in the Phoenix area, this event promises to significantly advance IAV technology within the community and industry, demonstrating its impact internationally.

The IAV Symposium will feature a variety of engaging events, including technical sessions, invited presentations, workshops, panel discussions, plenary talks, industry demonstrations, and educational activities aimed at students.

TOPICS OF INTEREST

The symposium will cover a broad range of topics related to intelligent autonomous vehicles (IAV) across various modalities. Submissions are invited on, but not limited to, the following topics:

Architectures for Autonomous Vehicles: Design and development of robust and scalable architectures for single and multiple autonomous vehicle systems.

Perception and Sensing: Innovations in sensing technologies, sensor integration, smart sensors, and sensor networks for improved perception.

Intelligent Electrified Vehicular Systems: Advanced estimation and control algorithms of electrified platforms, and advanced driver assistance systems.

Planning and Control: Methods for mission planning, local and global path planning, trajectory tracking, and control system design.

Localization and Navigation: Techniques for SLAM, map building, vehicle localization, and autonomous navigation.

Human-Vehicle Interaction: Studies on interaction dynamics between humans and autonomous systems, including user interface design and driver support.

Transportation Systems: Autonomous vehicle integration into modern transportation systems, including public transport and logistics.

Remote Operation and Teleoperation: Advances in remote monitoring, teleoperation, and human-in-the-loop control systems.

Robotics in Various Domains: Applications in domestic, service, rehabilitation, field robotics, maritime, and ocean exploration.

Swarm Robotics and Networked Systems: Development and control of networked IAVs, swarm robotics, and collaborative autonomous systems.

Fault Detection and Resilience: Fault diagnosis, detection, and mitigation strategies for improving the reliability of autonomous systems.

PAPER SUBMISSION AND REVIEW

Authors are invited to submit original contributions in English. Papers must be submitted through **Papercept** (<https://ifac.papercept.net/>) conference submission system. Accepted papers must not exceed 6 two-column pages in standard IFAC conference format.

MORE INFORMATION: <https://events.engineering.asu.edu/iav-2025>

Openings

MAE position announcement at Oklahoma State University

The School of Mechanical and Aerospace Engineering (MAE) at Oklahoma State University is pleased to invite applications for a tenure-track faculty position at the rank of Associate or Full Professor level. While all competitive candidates with expertise in all areas of mechanical engineering will be considered, we are particularly seeking expertise in the areas of data science and artificial intelligence, including algorithm and system design, physics-informed machine learning, data-driven modelling, big data assimilation, reduced order modeling, uncertainty quantification, high-performance computing, digital twins for complex systems, Internet of Things, cyber-physical systems, and other related areas with applications in mechanical and aerospace engineering discipline. Please refer to <https://okstate.csod.com/ux/ats/careersite/8/home/requisition/18467?c=okstatefortheopositiondescription>.

Open-Rank Teaching Professor Positions

The Department of Mechanical Engineering at Rowan University invites applications for Open-Rank non-tenure track Teaching Professor positions at the Assistant, Associate, or Full Professor level. The successful candidates must have a demonstrated commitment to teaching excellence at undergraduate and graduate levels, support the educational missions of the department and the university, and contribute to the institution and

profession through service. Applicants with expertise in all fundamental areas of mechanical engineering are invited to apply; however, the priority areas are:

1. Machine Design, Mechanical Systems, Quality and Reliability
2. Aerospace Engineering, Aerodynamics, Computational Fluid Dynamics
3. Finite Element Analysis, ANSYS, CAD, MATLAB
4. Heat Transfer, Fluid Dynamics, Thermodynamics

The successful candidate must have a PhD in Mechanical Engineering or a closely related discipline. In addition, excellent written and oral communication skills as well as relevant teaching experience with undergraduate students are expected. The appointment is 10-month full time, non-tenure-track, with renewable multi-year contracts, based on performance, departmental needs, and university and budgetary approvals.

For more details or to apply see full add available here: <https://jobs.rowan.edu/en-us/job/500052/openrank-teaching-professor-department-of-mechanical-engineering>

Please send any inquiries to employment@rowan.edu.

Opening faculty positions at Arizona State University

Posting / Application link: <https://apply.interfolio.com/157122>

The Ira A. Fulton Schools of Engineering at Arizona State University (ASU) and the School of Manufacturing Systems and Networks

seek applicants for a tenure-track or tenured faculty position in the area of Robotics and Autonomous Systems. The School of Manufacturing Systems and Networks (<https://msn.engineering.asu.edu/>), one of the eight Fulton Schools, houses vibrant engineering research programs at the undergraduate, masters, and PhD level related to Robotics and Autonomous Systems, as well as Manufacturing (learn more at <http://research.engineering.asu.edu/>). We seek applicants who can enhance our abilities in these areas as part of a community of experts. Particular areas of interest include, but are not limited to:

Digital Twins for Physical Systems related to robotics and autonomous systems Computational design and materials-aware embodiment of robotic systems, e.g. soft robotics, computational intelligence Virtual, augmented, and mixed reality for hybrid human-robot integration in the "industrial metaverse" Large Language Models, Natural Language Processing, and their applications to human-robot interactions. Theory and applications of machine learning and AI, as it relates to robotic perception, planning, and control. Autonomous and secure systems, especially as it relates to manufacturing in extreme environments Application Instructions Application review will begin December 1, 2024. Applications will continue to be accepted on a rolling basis for a reserve pool. Applications in the reserve pool may then be reviewed in the order in which they were received until the position is filled.

Please see the full posting here, at: <https://apply.interfolio.com/157122>, for full posting and instructions.



Presidential Faculty Fellow Position in Energy Transition Innovations

The Department of Mechanical and Aerospace Engineering at the University of Houston (UH) invites applications for two Presidential Frontier Faculty positions at the rank of tenure-track Assistant Professor or tenured early Associate Professor, depending on the qualifications of the successful candidates, with appointments beginning in Fall 2025.

The Presidential Frontier Faculty program at UH is a university-wide, integrated, interdisciplinary faculty hiring initiative designed to address federal priorities and societal challenges in health, energy, sustainability, and security. We seek an outstanding individual with demonstrated expertise or research potential in process systems engineering and the optimization of sustainable and emerging energy systems. Specific topics of interest include but are not limited to, the modeling, analysis, design optimization, and real-time control of renewables, hydrogen and fuel cell technologies, energy storage systems, and power generation, transmission, and distribution systems. The successful candidate is expected to develop collaborations and leverage synergies within UH across departments and colleges. They must establish a strong, nationally recognized, and externally funded research program and teach undergraduate and graduate-level courses. Candidates should have a strong track record of scholarship, a creative vision for future research, a commitment to engineering education, and excellent written and interpersonal communication skills. They must hold a PhD degree or equivalent in mechanical engineering or a related engineering field at the time of employment.

The Department of Mechanical and Aerospace Engineering at UH is home to 34 full-time faculty, approximately 80 doctoral students, 200 master's students, and over 1,000 undergraduates. UH is Texas' premier public metropolitan research and teaching institution with over 45,000 students located on a park-like campus proximal to downtown Houston, the fourth-largest city in the nation

The University of Houston is an Equal Employment Opportunity/Affirmative Action Institution and recognizes protected classes of race, color, sex (including pregnancy), genetic information, religion, age (40 and above), national origin, disability, veteran status, sexual orientation, gender identity or status, and gender expression as required by federal law. Veterans and persons with disabilities are encouraged to apply.

Application

Applicants should submit

- (1) a cover letter highlighting the candidate's strengths and interest in the position,
- (2) a curriculum vitae,
- (3) a statement of research vision,
- (4) a statement on teaching philosophy, and
- (5) names and contact information of three references.

To apply, please visit

<https://careers.uh.edu/jobs/>

Official transcripts are required and will be requested upon selection of the final candidates. All positions at the University of Houston are security sensitive and will require a criminal background check.



Presidential Faculty Fellow Positions in Aerospace Engineering

The Department of Mechanical and Aerospace Engineering at the University of Houston (UH) invites applications for two Presidential Frontier Faculty positions at the rank of tenure-track Assistant Professor or tenured early Associate Professor, depending on the qualifications of the successful candidates, with appointments beginning in Fall 2025.

The Department of Mechanical and Aerospace Engineering at the University of Houston seeks outstanding individuals with demonstrated expertise or research potential in space robotics, intelligent and autonomous space systems, space structures, aerospace materials, or in-space manufacturing.

Successful candidates will be expected to develop a strong, nationally recognized, and externally funded research program and teach aerospace engineering-related courses at both the undergraduate and graduate levels. Candidates should have a strong track record of scholarship, a creative vision for future research, a commitment to engineering education, and excellent written and interpersonal communication skills. Candidates must hold a PhD in aerospace, mechanical, electrical engineering, or a closely related field at the time of employment.

The Department of Mechanical and Aerospace Engineering at the University of Houston is expanding its capabilities and programs in aerospace engineering research and education with plans to offer B.S. and Ph.D. degrees in aerospace engineering, and the new hires will have the opportunity to shape the expansion of the department. Houston is home to the NASA Johnson Space Center and has a broad industrial base in aerospace, energy, materials, and manufacturing technologies, offering ample opportunities for collaborative research.

The University of Houston is an Equal Employment Opportunity/Affirmative Action Institution and recognizes protected classes of race, color, sex (including pregnancy), genetic information, religion, age (40 and above), national origin, disability, veteran status, sexual orientation, gender identity or status, and gender expression as required by federal law. Veterans and persons with disabilities are encouraged to apply.

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DEPARTMENT OF MECHANICAL ENGINEERING

2024-2025 FACULTY SEARCH

The Department of Mechanical Engineering at The University of Alabama (UA) seeks outstanding applicants for multiple tenure-track and tenured faculty positions at all ranks. Candidates with research interests in all areas of mechanical engineering are encouraged to apply. Additionally, candidates with research expertise in the areas of biomechanics and biosystems engineering, robotics and mechatronics, sustainable energy, clean energy, combustion, advanced manufacturing, multi-scale computation and simulation, and micro/nanoscale systems and engineering are particularly encouraged to apply since these areas are a focus of one or more of the positions in this search.

Applicants must have a Ph.D. in mechanical engineering or a closely related field, demonstrate excellence in scholarly research, and show a strong commitment to teaching undergraduate and graduate students. Extensive collaboration opportunities exist within the department and across campus; therefore, candidates should build upon and expand the strengths of our faculty.

Candidates with prestigious achievements in their field and exceptional national and international reputations will be eligible for consideration for significant endowment support through the new \$100 million Shelby Endowment for Distinguished Faculty at UA and can be appointed as an Endowed Shelby Distinguished Associate Professor or Professor (www.provost.ua.edu/Shelby/) as appropriate.

As one of the first five universities in the nation to offer engineering instruction, UA has more than 185 years of engineering education experience. UA's College of Engineering is committed to conducting leading-edge research, providing unparalleled educational opportunities, and investing in students who will be the scholars and industry professionals shaping the future of the field of engineering. Over the past decade, the College's research activity has more than tripled, and its graduate programs have roughly doubled in size in just the past five years. With hundreds of award-winning faculty and staff members, a diverse offering of nationally accredited programs, and an array of outstanding new facilities and resources, the College has positioned itself for success as a leader in engineering education and research.

Overall, UA shapes a better world as a comprehensive university through its teaching, research, and service. With a global reputation for excellence, UA provides an inclusive, forward-thinking environment offering nearly 200 degree programs on a beautiful, student-centered campus. UA advances discovery, creative inquiry, and knowledge through more than 30 research centers and has R1 – Very High Research Activity status by the Carnegie Classification of Institutions of Higher Education.

Review of applications will begin immediately and continue until the positions are filled. Visit UA's employment website at <https://careers.ua.edu/jobs/search/college-of-engineering> or scan the QR code for more information and to apply.

The University of Alabama is an equal-opportunity employer (EOE), including an EOE of protected vets and individuals with disabilities. Candidates from underrepresented groups in engineering are strongly encouraged to apply.



Assistant (Tenure-Track) or Associate/Full (Tenured) Professor in Mechanical and Aerospace Engineering (MAE) (JPF09360)

Assistant (Tenure-Track) or Associate/Full (Tenured) Professor in Mechanical and Aerospace Engineering (MAE)

Job #JPF09360

- Mechanical and Aerospace Engineering / Henry Samueli School of Engineering / UC Irvine

Apply now: <https://recruit.ap.uci.edu/JPF09360/apply>

View this position online: <https://recruit.ap.uci.edu/JPF09360>

POSITION OVERVIEW

Salary range: The salary range for this position is \$103,700 - \$224,900. The posted UC salary scales set the minimum pay determined by rank and step at appointment. See Table https://drive.google.com/file/d/1kpPDKafR0wSKhCX7fJJoM3rck_EAc02/view. "Off-scale salaries", i.e. a salary that is higher than the published system-wide salary at the designated rank and step, are offered when necessary to meet competitive conditions.

APPLICATION WINDOW

Open date: October 31, 2024

Next review date: Sunday, Jan 5, 2025 at 11:59pm (Pacific Time)

Apply by this date to ensure full consideration by the committee.

Final date: Monday, Jun 30, 2025 at 11:59pm (Pacific Time)

Applications will continue to be accepted until this date, but those received after the review date will only be considered if the position has not yet been filled.

POSITION DESCRIPTION

Assistant (Tenure-Track) or Associate/Full (Tenured) Professor in Mechanical and Aerospace Engineering (MAE)

Faculty Position in

Control of Aerospace Systems, Guidance, & Navigation for Aerospace Applications

The Department of Mechanical and Aerospace Engineering at the University of California, Irvine (UCI) is inviting applications for a tenure-track/tenured faculty position at the assistant, associate, or full professor rank, with an anticipated start date of July 1, 2025.

To support the future of aerospace innovation, the rapidly evolving landscape of aerospace engineering, driven by initiatives such as NASA's Artemis program, the United States Space Force, and the ongoing pursuit of advanced aerial mobility, calls for pioneering innovations in the control of aerospace systems, guidance, and navigation for aerospace applications. Advanced technologies in these areas are crucial for precision in spacecraft and aircraft positioning, course adjustments, and the success of longer-duration missions, and they also play a vital role in enhancing aircraft performance, safety, and efficiency. To address these grand challenges, UCI's Department of Mechanical and Aerospace Engineering seeks exceptional applicants with expertise in the control of aerospace systems, as well as guidance and navigation for space applications.

Areas of Interest include:

- Development of advanced Guidance, Navigation, and Control (GNC) systems for space and air applications.
- Advanced control and optimization techniques for spacecraft and aircraft.
- Avionics and robust communication/navigation infrastructure.
- Systems for enhancing aerial mobility.
- Innovations in autonomous systems, including autonomy and robotics for lunar and Martian exploration.

Applications should be submitted by January 5th, 2025. This position will remain open until filled. Apply online at <https://recruit.ap.uci.edu/JPF09360>.

The University of California is one of the premier public university systems in the world. UCI is a member of the Association of American Universities (AAU), is ranked as a top ten public university by U.S. News and World Report and was identified by the New York Times as number one among U.S. universities that do the most for low-income students. UCI is a Minority Serving Institution (MSI), a Hispanic-Serving Institution (HSI) and an Asian American and Native American Pacific Islander-Serving Institution (AANAPISI). These federal designations align with UCI's aspiration to be a national leader and global model of inclusive excellence. We seek faculty who are committed to inclusive excellence as well as diverse faculty who will be role models for our students. UCI is located in Orange County, four miles from the Pacific Ocean and 45 miles south of Los Angeles. Irvine offers a very pleasant year-round climate, numerous recreational and cultural opportunities.

QUALIFICATIONS



Research Scientist Open Positions

The Autonomous Vehicle Mobility Institute (AVMI) <https://www.wpi.edu/research/centers/avmi> at Worcester Polytechnic Institute (WPI) <https://www.wpi.edu/> in Massachusetts offers **three Research Scientist positions**.

Position Index: AVMI-NAI-2024

This Research Scientist position is offered for basic and applied research in Natural and Responsible Artificial Intelligence. R&D work is in frontier areas of neural, non-neural, and distributed intelligence, and might include, but not limited to thinking and task learning, intelligent behavior when fulfilling a task and multi-task operations in dynamic environments, non-neural controls, and cognition and reasoning issues. Applications include Human-Machine Integrated Formations of humans and autonomous vehicles, vehicle autonomous systems, and systems of autonomous vehicles at various levels of autonomy and intelligence. The person hired for this position is expected to develop new research direction(s) in one or several above-listed areas and build a technical laboratory to lead his/her R&D at AVMI and contribute to the Digital Engineering ecosystem.

Position Index: AVMI-CSE-2024

This Research Scientist position is offered in computer science and software engineering and relates to algorithm design and software application design and development, testing, deploying and maintenance. R&D work is expected to be in frontier areas of digital engineering to enable real-time and faster-than-real-time physics-based simulation and virtualization in the ecosystem of Human-Machine Integrated Formations by advancing the ecosystem's software framework and its modularity, improving and optimizing robustness of the operational system, middleware, and application software. The person hired for this position is expected to serve as a technical lead for the AVMI Autonomous Systems Laboratory by developing basic research and applied R&D in the above-listed areas.

Position Index: AVMI-PVS-2024

This Research Scientist position is in research areas of physics-based modeling, simulation, and design of

1. **Exteroceptive sensors** for the use in autonomous vehicles for navigation, perception, localization, look-ahead landscape/terrain identification, weather assessment, and terrain trafficability assessment in-real time, and
2. **Proprioceptive sensors** embedded in vehicle powertrain and chassis systems for the use in autonomous control of autonomous vehicle systems. The research work will also include physical sensor design, physical and virtual sensor validation in varieties of environmental conditions and terrain texture, soil density and mechanical properties, etc.

The person admitted for this position is expected to develop a new research direction(s) in one or several above-listed areas that include, although are not limited to sensors for facilitating vehicle autonomy, non-destructive soil identification methods, managing data of exteroceptive and proprioceptive sensors, machine learning algorithms for terrain recognition, etc. The successful candidate will build a technical laboratory to lead his/her sensor-related R&D at AVMI and contribute to the Digital Engineering ecosystem.

Applicants should have US citizenship or NATO nations citizenship, US Permanent Residency, or a citizenship from five countries of The Technical Cooperation Program (USA, UK, Canada, Australia, New Zealand), citizenship of Japan, South Korea or India.

Interested candidates should email a single PDF that includes:

1. **A letter** with a statement of purpose for a particular position (include the Position Reference Index),
2. **CV** with their qualifications, research achievements and clear indication of previous accomplishments, and motivation in a position of their interest. The names and contact information of **three references** should be included in the CV (the references will be contacted once an interview is scheduled)

to **Prof. Vladimir Vantsevich** vvantsevich@wpi.edu and **Prof. Lee Moradi** lmoradi@wpi.edu .

Review of applications will begin in **November 2024** and continue until the positions are filled.

Professors (all ranks) in Control, Robotics, and Artificial Intelligence

POSITION DESCRIPTION

The School of Automation and Intelligent Manufacturing at Southern University of Science and Technology (SUSTech), China, invites applications for a tenure-track or tenured faculty position in the areas of Control, Robotics, and Artificial Intelligence.

The School of Automation and Intelligent Manufacturing (<https://sdim.sustech.edu.cn/>) is experiencing rapid growth and expansion, on a mission to become an internationally recognized leader in the field of automation and intelligent systems. We are dedicated to fostering a dynamic academic environment that attracts and nurtures exceptional talents. We pride ourselves on our world-class facilities, state-of-the-art research, and a forward-thinking approach to curriculum development that is transforming the way we educate the next generation of leaders in automation and intelligent systems.

We are seeking applicants who will enhance our academic programs, foster transdisciplinary teaching and research, and support the university's goals, which include fostering student success, transforming society, valuing entrepreneurship, and conducting research that is inspired by real-world applications. Faculty members are expected to develop an internationally recognized and externally funded research program, adopt effective pedagogical practices in the development and delivery of graduate and undergraduate courses, advise both undergraduate and graduate student research and projects, and undertake service activities.

QUALIFICATIONS

- ✧ A Ph.D. in a relevant field (system control, robotics, artificial intelligence, or a closely related discipline).
- ✧ A proven track record of research excellence and publications in reputable journals.
- ✧ A demonstrated commitment to fostering a diverse and inclusive academic environment.
- ✧ The ability to work collaboratively with faculty, students, and industry partners.

HOW TO APPLY

To apply, please submit your CV, a statement of research and teaching interests, and the names and contact information of three references to fum@sustech.edu.cn. We are an equal opportunity employer and value diversity in our community. We look forward to receiving your application and welcoming you to our team!

The deadline for assuring full consideration is **December 20, 2024**. However, these positions will remain open and applications may be considered until all positions are filled.