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WELCOME TO THE ACC2024

THE AMERICAN AUTOMATIC CONTROL COUNCIL

The American Automatic Control Council (AACC) was established in 1957, “to promote cooperation among the various segments of the automatic control profession within the US, and to represent the US in international activities.” To implement this mission, the AACC is the United States’ National Member Organization of the International Federation for Control (IFAC). In this role, AACC facilitates participation in IFAC by US control engineers.

AACC does not have individuals as members. Rather, to widely promote cooperation throughout the control profession, our members include professional engineering societies that have an interest in automatic control. The current membership is: American Institute of Aeronautics and Astronautics (AIAA), American Institute of Chemical Engineers (AIChE), Applied Probability Society (APS, a subdivision of INFORMS), American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE), International Society of Automation (ISA), Society for Modeling & Simulation International (SCS), and Society for Industrial and Applied Mathematics (SIAM). Each member society selects a person to represent their organization on the AACC Board of Directors who direct the activities of AACC. AACC is a non-profit organization, returning their entire annual surplus to its member organizations.

In addition to representing the US in IFAC, AACC’s major activities include two high-quality annual conferences: the American Control Conference (ACC) offered in late Spring or early Summer, and the Modeling, Estimation and Control Conference (MECC) offered in the Fall. The proceedings of these conferences are archived in IEEE Xplore and IFAC’s PapersOnLine, respectively. AACC also coordinates all IFAC symposiums, workshops and conferences held in the US. Please visit the AACC website a2c2.org for more information about upcoming conferences.

AACC sponsors a set of awards that recognize outstanding achievement in control theory and practice. The awards are given annually at the ACC. You are invited to attend this year’s ceremony on Thursday, 11 July 2024, starting at 11:45 AM in the Frontenac Ballroom.

AACC also supports control education from K-12 through post-graduate studies. The AACC provides opportunities for personal and professional development and recognition to its large cast of volunteers, on whom it is crucially dependent for its operations and success.
To find out more, either visit the AACC booth in the exhibit area or browse our website. If you think you may want to volunteer for AACC activities, stop by the booth and leave your name. There are many opportunities for volunteers to help coordinate and promote automatic control events.
GREETINGS FROM THE AACC PRESIDENT

Welcome to Toronto and the 2024 American Control Conference (ACC). As an annual gathering sponsored by the American Automatic Control Council (AACC), the ACC brings together experts from academia, government, and industry across all engineering disciplines as well as applied mathematics, to share new and creative ideas and results in control. Please take this opportunity to socialize and collaborate with old friends as well as making new ones. It is amazing to see all the student attendees; we hope you use the conference as a vehicle to learn and interact with the senior members of our community.

Over the past several years, Dr. Martha Grover and her Operating Committee have spent an enormous amount of time and effort planning the conference. On behalf of all the participants, I want to extend our thanks for an outstanding job. We are all looking forward to the technical sessions, plenaries, workshops, special sessions, exhibits, social events, and receptions.

I also want to extend my heartfelt appreciation to all the volunteers including the General Chairs, Conference Operating Committees, Board of Directors, AACC Standing Committees, and the Officers that make the ACCs and all other AACC sponsored conferences outstanding events. I would also like to thank all the authors and reviewers for their contributions to ACC 2024.

Thank you for attending this premier control event and enjoy your time in Toronto,

Robert P. Judd, Ph.D.
President, American Automatic Control Council
GREETINGS AND THANKS FROM THE GENERAL CHAIR

It is my pleasure to welcome you all to the 2024 American Control Conference in Toronto. The American Control Conference provides a unique opportunity for members of the controls community—from across the nine member societies of AACC—to gather together and share their latest findings. This year we are returning to Canada after the successful 2012 ACC in Montreal, and we appreciate the hospitality of Toronto, the key contributions of our five members of the Operating Committee from Canadian institutions, and the foundational support of IFAC Canada in establishing this exciting venue on the Toronto waterfront.

This year we are partnering with AACC on the Bystander Intervention workshop, to help ensure that the ACC continues to be a safe and welcoming experience for all our participants. Thank you to those members of the community who participated in this inaugural workshop. We have extensive financial support for students at this year’s ACC, thanks to the generous support of the US National Science Foundation, AACC, and member societies, enabling us to support the conference registration of 200 students and hotel costs for 90 students. Our student-industry networking session on Wednesday provides a venue for students to build their community here at the conference and beyond. The student contest by Quanser returns to the 2024 ACC after a successful inaugural contest in San Diego last year. Be sure not to miss the Student Best Paper Session on Wednesday starting at 3:00 pm.

I am grateful for all the critical contributions of the Operating Committee, without whom this all-volunteer conference would not be possible. Program Chair Kam Leang has led the review and construction of the technical program. Thanks to our vibrant community, we had a robust and strong set of submissions. I hope you all will find new ideas and receive constructive feedback throughout the technical program this week.

With best wishes for a great conference experience, and thank you for your support.

Martha Grover
General Chair, 2024 American Control Conference
TECHNICAL PROGRAM OVERVIEW

The Technical Program of the 2024 American Control Conference captures the most recent advancements made and emerging trends of control theory and applications (see word cloud below). We thank all contributors for the 1391 paper submissions, of which 864 will be published in the conference proceedings, leading to an acceptance rate of 62%. The program also includes 34 invited sessions, 14 workshops, 2 tutorial sessions, 20 special sessions, and 43 Late-Breaking News posters.

We are happy to have four plenary speakers share their exciting work in control. You will hear them describe the latest in uncrewed autonomous vehicles, control of biological processes, decision-making algorithms, and AI-driven approaches to control. The conference offers great opportunities for control researchers and practitioners to hear and learn about the latest work in control through morning Rapid Interactive sessions, followed by afternoon traditional technical sessions.

I want to thank the entire Program Committee, as well as Luis Ricardez-Sandoval, Invited Sessions Chair, and Hugh Liu, Industry and Applications Chair for their valuable input and outstanding editorial service. My sincere appreciation also goes to the Society Review Chairs, Associate Editors, and Associate Editors-at-Large for their diligent and dedicated work. I especially thank the dedicated anonymous reviewers for their constructive reviews of submitted papers. Finally, I want to thank General Chair Martha Grover, Conference Editorial Board Chair Amir Aghdam, and Pradeep Misra of PaperCept, Inc. for all their efforts and support in creating the program. Please enjoy the conference and I hope to see you in Toronto this week!

Kam K. Leang
Program Chair, 2024 American Control Conference
GREETINGS FROM THE IFAC PRESIDENT

As the President of IFAC (International Federation of Automatic Control), I extend my warm congratulations to ACC 2024 in Toronto. The ACC is organized under the auspices of the American Automatic Control Council (AACC), which serves as the US National Member Organization (NMO) of IFAC.

AACC holds a significant position within IFAC, having been an NMO since the federation's inception in 1957. Notably, three past IFAC Presidents—Harold Chestnut (1957-1958), John C. Lozier (1972-1975), and Stephen J. Kahne (1993-1996)—have hailed from AACC. Many scholars and engineers representing AACC currently hold key roles within IFAC, serving as Executive Officers, Technical Board Members, Publication Board Members, Conference Board Members, and various Committee Members. AACC also plays a significant role in hosting numerous IFAC Conferences and its members make substantial contributions to IFAC’s publications.

While IFAC itself doesn't have individual members, it established "IFAC Affiliates" several years ago, along with a comprehensive portal (https://affiliates.ifac-control.org/). This platform is free to join for all scholars and engineers in automatic control, providing them with various benefits such as newsletters and reduced registration fees at IFAC Conferences.

The 23rd IFAC World Congress in 2026 will take place in the picturesque beach-front city of Busan, Republic of Korea. Most nationalities will not require a visa for entry. Busan is renowned internationally as a prime destination for meetings and has been recognized as the best destination in Asia by CNN. The vision for IFAC WC 2026 is to foster global friendship through control technology, drawing strength from innovative global diversity. Furthermore, the notion of global friendship in the future will embrace living harmoniously with the convergence of artificial intelligence (AI).

ACC and various IFAC conferences serve not only as vibrant forums for technical discussions but also as platforms for researchers worldwide to collaborate and exchange ideas. These technical meetings offer an exciting opportunity to forge connections with diverse individuals from around the world. I extend my best wishes for the success of ACC 2024.

Dongil “Dan” Cho
President, the International Federation of Automatic Control
PLENARY SESSIONS

Plenary Lecture

Control of Uncrewed Vehicle Systems – from Unconventional Flyers to Maritime Autonomy

Kingsley Fregene
Lockheed Martin, USA

Wednesday, July 10, 8:30 – 9:30
Metro E/C

This talk will provide an overview of research and technology development efforts for controlling uncrewed vehicles operating in the aerial and maritime domains, and across domains. In the first part of the talk, we will describe autonomous control development for a variety of bio-inspired and hybrid uncrewed vehicles including a family of single and double-winged micro air vehicles (MAVs) inspired by fruits and seeds. We will also highlight selected application areas in omni-directional sensing and navigation-aiding. In the second part of the talk, we will discuss control schemes for uncrewed maritime vehicles and demonstrate application to relevant missions. We will describe multi-vehicle control and experiments in coordinated control across domains. The talk will conclude by taking a brief look at human-autonomy teaming in the context of control for optionally-crewed air vehicles.

Kingsley Fregene is the Director of Technology Integration, overseeing practices for defining and executing the strategic Research and Technology portfolio of Lockheed Martin’s Corporate Technology Office. Prior to his current role, he was the Chief Engineer for Applied Research at Lockheed Martin in Dallas, TX, where he guided the execution of a diverse portfolio of advanced technology development efforts. Before that, he led the Robotics & Intelligent Systems group at Lockheed Martin Advanced Technology Labs, and a variety of autonomous control, sensing, and civil aviation R&D efforts at Honeywell.

Kingsley has served on the editorial boards and program committees of IEEE
Control Systems Society and Robotics & Automation Society periodicals and conferences. He has also served as Chair, IEEE Technical Committee on Aerospace Controls. He was the 2021 recipient of the Control Engineering Practice Award from the American Automatic Control Council. Kingsley and his work have featured in National Geographic: Engineering Inspirations from Nature, a video and workbook series for middle school students, and in the children’s books Tiny Robots (2015) and Mimic-Makers: Biomimicry Inventors Inspired by Nature (2021).

Kingsley is a Fellow of the IEEE, holds several patents, and has authored journal articles, conference papers and book chapters, including 4 best paper award winners, in autonomy, robotics, uncrewed vehicle systems, machine learning, applications of AI, and intelligent control systems. He received his Ph.D. and M.A.Sc. degrees from the University of Waterloo, Canada, and his B.Eng. with first class honors from Federal University of Technology, Owerri, Nigeria, all in Electrical & Computer Engineering.
Plenary Session

A Control Systems Approach to Cell Fate Reprogramming

Domitilla Del Vecchio
Massachusetts Institute of Technology, USA

Thursday, July 11, 8:30 – 9:30
Metro E/C

Today, it is possible to reprogram the type of a cell for on-demand patient-specific cell therapy, wherein damaged cells in the body are replaced with healthy cells of the correct type generated from easy-to-extract patient’s cells. One approach to produce cells of the desired type is to first reprogram somatic cells, such as skin cells, to pluripotent stem cells, and to then differentiate these pluripotent cells down to the cell type in need. Both processes require accurate control of the temporal concentration of fate-specific proteins, called transcription factors, in the cell in order to efficiently generate high quality output cells. However, so far, accurate control of cellular concentrations has been out of reach. Practitioners inject DNA that produces the appropriate transcription factors in the starting cells at constant rates, without any control on cellular concentrations. In the past decade, the advances in engineering biology have reached the stage where we can implement nonlinear controllers to regulate the cellular level of key molecular players. In this talk, I will illustrate key obstacles to accurate control of protein levels in mammalian cells by conceptualizing the problem through input/output nonlinear, stochastic, models of gene regulation in the context of cell fate determination. I will then use these models to design biomolecular high-gain and integral feedback controllers in mammalian cells to achieve set-point regulation robustly to noise and cellular perturbations. Finally, I will go back to the problem of reprogramming somatic cells to pluripotency and I will show our controllers in action both as a way to uncover optimal reprogramming trajectories and as a way to enforce more accurately optimal transcription factor levels during reprogramming. This is the first instance in which biomolecular controllers have been used for pluripotent stem cell reprogramming. With these tools and experimental demonstrations, we have set the foundations for future research on the use of sophisticated biomolecular networks as controllers of complicated biological processes.
**Domitilla Del Vecchio** received her Ph. D. degree in Control and Dynamical Systems from the California Institute of Technology, Pasadena, and the Laurea degree in Electrical Engineering (Automation) from the University of Rome at Tor Vergata in 2005 and 1999, respectively. From 2006 to 2010, she was an Assistant Professor in the Department of Electrical Engineering and Computer Science and in the Center for Computational Medicine and Bioinformatics at the University of Michigan, Ann Arbor. In 2010, she joined the Department of Mechanical Engineering at the Massachusetts Institute of Technology (MIT), where she is currently Professor and member of the Synthetic Biology Center.

She is a Fellow of the International Federation of Automatic Control (2022), an IEEE Fellow (2021), and a recipient of the Newton Award for Transformative Ideas during the COVID-19 Pandemic (2020), the 2016 Bose Research Award (MIT), the Donald P. Eckman Award from the American Automatic Control Council (2010), the NSF Career Award (2007), the American Control Conference Best Student Paper Award (2004), and the Bank of Italy Fellowship (2000). Her research focuses on developing techniques to make synthetic genetic circuits robust to context and on applying these to biosensing and cell fate control for regenerative medicine applications.
The convergence of physical and digital systems in modern engineering applications has inevitably led to closed-loop systems that exhibit both continuous-time and discrete-time dynamics. These closed-loop architectures are modeled as hybrid dynamical systems, prevalent across various technological domains, including robotics, power grids, transportation networks, and manufacturing systems. Unlike traditional “smooth” ordinary differential equations or discrete-time recursions, solutions to hybrid dynamical systems are generally discontinuous, lack uniqueness, and have convergence and stability properties that are defined with respect to complex sets. Therefore, effectively designing and controlling such systems, especially under disturbances and uncertainty, is crucial for the development of autonomous and efficient data-driven engineering systems capable of achieving adaptive and self-optimizing behaviors. In this talk, I will delve into recent advancements in the analysis and design of feedback controllers that can achieve such properties in complex scenarios via the synergistic use of adaptive “seeking” dynamics, robust hybrid control, and decision-making algorithms. These controllers can be systematically designed and analyzed using modern tools from hybrid dynamical systems theory, which facilitate the incorporation of "exploration" and “exploitation" behaviors within complex closed-loop systems via multi-time scale tools and perturbation theory. The proposed methodology leads to a family of provably stable and robust algorithms suitable for solving model-free feedback stabilization and decision-making problems in single-agent and multi-agent systems for which smooth feedback solutions fall short.
Jorge I. Poveda received double B.Sc. degrees in Electronics Engineering and Mechanical Engineering, both from the University of Los Andes, Bogota, Colombia, in 2012. He received his M.Sc. and Ph.D. degrees in Electrical and Computer Engineering from UC Santa Barbara in 2016 and 2018, respectively. After receiving his Ph.D., he was a Postdoctoral Fellow in the School of Engineering and Applied Sciences at Harvard University. Afterward, he joined the faculty of the Electrical, Computer, and Energy Engineering Department at the University of Colorado, Boulder, where he was an Assistant Professor from 2019 until 2022. Subsequently, he joined the Electrical and Computer Engineering Department at the University of California, San Diego, where he is currently an Assistant Professor. He has received the CCDC Outstanding Scholar Fellowship and Best Ph.D. Thesis awards from UC Santa Barbara, the CRII and CAREER awards from the National Science Foundation, the Young Investigator Award from the Air Force Office of Scientific Research, and the 2023 Donald P. Eckman award from the American Automatic Control Council. His research interests are in feedback control, hybrid and adaptive dynamical systems, real-time optimization, and network systems.
In an era where Artificial Intelligence (AI) is often seen as a universal solution for any complex problem, this presentation offers a critical examination of its role in the field of automatic control. To be concrete, I will focus on Optimal Control techniques, navigating through its history and addressing the evolution from its traditional model-based roots to the emerging data-driven methodologies empowered by AI.

The presentation will delve into how the theoretical underpinnings of Optimal Control have been historically aligned with computational capabilities, and how this alignment has shifted over the years. This juxtaposition of theory and computation motivates a deeper investigation into the diminishing relevance of certain traditional control methods amidst the AI revolution. We will critically examine scenarios where AI-driven approaches could outperform classical methods, as well as cases where the hype surrounding AI overshadows its actual utility.

The talk will conclude with a nuanced view of state-of-the-art optimal control methods in practical applications including self-driving cars, advanced robotics and energy efficient systems. From this perspective, we will identify and explore future potential directions for the field, including the design of learning control architectures which seamlessly integrate predictive capabilities at every level, focusing on systems that can autonomously refine their performance over time through continuous learning and interaction with their environment.
Francesco Borrelli received his ‘Laurea' degree from the University of Naples Federico II', Italy in 1998, and his PhD from the Automatic Control Laboratory at ETH-Zurich, Switzerland in 2002. He is currently a Professor at the Department of Mechanical Engineering at the University of California, Berkeley, USA, where he conducts research in the field of predictive control.

Professor Borrelli has authored over 200 publications in the field of predictive control and is the author of the book Predictive Control, published by Cambridge University Press. He has received several awards for his contributions to the predictive control field, including the 2009 NSF CAREER Award, the 2012 IEEE Control System Technology Award, and was elected IEEE Fellow in 2016. In 2017, he was awarded the Industrial Achievement Award by the International Federation of Automatic Control (IFAC) Council.

Professor Borrelli has been a consultant for major international corporations since 2004, with his recent industrial activities focusing on the application of predictive control in self-driving vehicles, utility scale solar power plants, automotive control systems, and building energy efficiency control. He was the founder and CTO of BrightBox Technologies Inc, a company focused on cloud-computing optimization for autonomous systems, and was the co-director of the Hyundai Center of Excellence in Integrated Vehicle Safety Systems and Control at UC Berkeley. He is also the founder of WideSense Inc., a company focused on E-Mobility.

Professor Borrelli's research interests include model predictive control, learning, and their application to robotics, transportation, and energy control systems.
AACC AWARDS

The American Automatic Control Council sponsors various awards. These awards are given to recognize excellence in scientific, technological, or educational contributions to automatic control. Congratulations to this year’s winners!

Donald P. Eckman Award

Mengdi Wang, Princeton University
For extraordinary contributions to the intersection of control, dynamic systems, machine learning, and information theory.

Mengdi Wang is associate professor at the Center for Statistics and Machine Learning, Department of Electrical and Computer Engineering, Department of Computer Science (by courtesy) and the Omenn-Darling Bioengineering Institute (by courtesy) at Princeton University. Mengdi received her PhD in EECS from MIT in 2013, where she worked with Dimitri P. Bertsekas at the Laboratory for Information and Decision Systems. She was a visiting research scientist at DeepMind, Institute of Advanced Studies, and Simons Institute on Theoretical Computer Science. Mengdi is currently leading Princeton's AI Accelerated Innovation Initiative, and is also affiliated with the Princeton Language+Intelligence Initiative. She works on reinforcement learning, generative AI and LLM + RL agents for bio and general science applications. She was Program Chair for ICLR 2023 and Senior AC for Neurips, ICML, COLT.
Richard E. Bellman Control Heritage Award

Naomi Ehrich Leonard, Princeton University

For fundamental contributions to geometric control theory, networked multiagent systems, and for bridging control theory with ecological systems, neuroscience, and the arts.

Naomi Ehrich Leonard is Chair and Edwin S. Wilsey Professor of Mechanical and Aerospace Engineering at Princeton University. She is associated faculty in Princeton’s Program in Applied and Computational Mathematics, Biophysics Program, and the Princeton Neuroscience Institute. During 2013-2023, she directed Princeton’s Council on Science and Technology. She is Founding Editor of the Annual Review of Control, Robotics, and Autonomous Systems. Leonard received her BSE in Mechanical Engineering from Princeton University in 1985. From 1985 to 1989 she worked as an engineer in the electric power industry. She received her PhD in Electrical Engineering from the University of Maryland in 1994. Leonard is a MacArthur Fellow, a member of the American Academy of Arts and Sciences, and a Fellow of the ASME, IEEE, IFAC, and SIAM. Previous honors include the 2023 IEEE Control Systems Award, the IEEE Control Systems Society’s 2017 Hendrik W. Bode Lecture Prize, the ASME’s 2014 Nyquist Lecture Prize, the American Automatic Control Council’s 2020 John R. Ragazzini Education Award and 2022 O. Hugo Schuck Best Paper Award (with S. Park), and the IFAC’s 1999 Automatica Best Paper Award. Leonard works in control theory, nonlinear dynamics, and geometric mechanics. She was among the first to investigate the simple rules that enable individual agents—whether living organisms or robotic vehicles—to work together in groups by coordinating decision-making, sensing, and motion. In the early 2000’s, she led a multidisciplinary team on the development and deployment of a first-of-its-kind automated and adaptive ocean observing system featuring a coordinated network of underwater gliders. Leonard has used control theory to make contributions in a range of disciplines with collaborators in oceanography, ecology and evolutionary biology, neuroscience, and the arts.
John R. Ragazzini Education Award

John Hedengren, Brigham Young University

For contributions to control education with the Arduino-based Temperature Control Lab, Gekko Optimization Suite software, interactive online resources, videos, and open-access APMonitor online courses for programming, control, and optimization.

Dr. John Hedengren is a Professor at Brigham Young University in the Chemical Engineering Department. He leads the BYU PRISM group with a focus on physics-informed machine learning for optimization of energy systems, unmanned aircraft, and drilling. He led the development of the Temperature Control Lab that is used by many universities for process control education. His publications span topics of data science, machine learning, carbon capture, unmanned aerial systems, and predictive control. His highest cited paper is the Gekko Optimization Suite as a platform for engineering optimization and model predictive control. Beyond his academic pursuits, Dr. Hedengren is actively involved in professional service. He is a CACHE Trustee, develops webinars for AIChE CAST division, and is the Communications Chair for the American Automatic Control Council. He is chair of the IEEE CSS Technical Committee on Control Education to promote public awareness, university education, and continuing education related to control. The committee develops laboratory experiments, computer-aided learning, and the use of distance and virtual education technologies to highlight the cross-disciplinary nature of control. He has a PhD from the University of Texas at Austin coupled with a 7-year tenure in the chemical industry. His expertise has been recognized by the Society of Petroleum Engineers where he served as a Distinguished Lecturer. He delivers university and professional education on control, optimization, and machine learning through APMonitor online resources. He is the recipient of the 2014 AIChE David Himmelblau Award and the 2018 AIChE Computing Practice Award.
Babatunde A. Ogunnaike Control Practice Award

**Thomas A. Badgwell**, University of Texas, Austin

*For lifetime achievement in the development and application of Model Predictive Control technology, and for leadership in the international process control community.*

Thomas A. (Tom) Badgwell, PhD, PE, is a Professor of Practice in the McKetta Department of Chemical Engineering at The University of Texas at Austin. He earned a BS degree from Rice University and MS and PhD degrees from the University of Texas at Austin, all in Chemical Engineering, and he is registered as a Professional Engineer in Texas. Tom’s career has focused on modeling, optimization, and control of chemical processes, with past positions at Setpoint, Fisher/Rosemount, Rice University, Aspen Technology, and ExxonMobil. He is a co-founder of Collaborative Systems Integration, an Austin-based startup providing systems integration services and software products for Open Process Automation (O-PAS) based systems. Tom is a Fellow of the American Institute of Chemical Engineers (AIChE) and a past Director of the Computing and Systems Technology (CAST) Division, from which he received the Computing Practice Award in 2013. He is also a member of the IEEE Control System Society, in which he serves as a Distinguished Industrial Lecturer for 2024. Tom was inducted into the Control Global Process Automation Hall of Fame in 2022. He has served as an Associate Editor for the Journal of Process Control, as a Member of the IFAC Industry Committee, and is presently the Vice Chair, Industry, on the IFAC Technical Committee (6.1) on Chemical Process Control. Tom served as an Industrial Trustee of the Computer Aids in Chemical Engineering (CACHE) Corporation, and as the Co-Chair of the inaugural CACHE-sponsored Foundations Of Process Analytics and Machine learning (FOPAM) conference in 2019. He has 5 patents, and his 25 refereed publications have received over 11,000 citations.
O. Hugo Schuck Best Paper Award (Application)

Iman Nodozi, Jared O’Leary, Ali Mesbah, Abhishek Halder

Iman Nodozi is a PhD student in Electrical and Computer Engineering with the University of California at Santa Cruz, USA. He received his BS degree in Electrical Engineering from the Hamedan University of Technology, Hamedan, Iran, in 2013, and his M.S. degree in Electrical Engineering from Imam Khomeini International University, Qazvin, Iran, in 2016. His primary research interests include stochastic systems, control, optimization, and machine learning. At UC Santa Cruz, he has received the Baskin School of Engineering Dissertation Year fellowship (2023-24) and the Regent's Fellowship (2019-20).

Jared O’Leary earned a PhD in Chemical Engineering from UC Berkeley in August 2022, where he worked on characterizing, modeling, and controlling colloidal self-assembly systems, which demonstrate intrinsically stochastic and nonlinear dynamics. Jared's thesis work aimed to uncover a deeper mechanistic understanding of colloidal self-assembly by investigating strategies based on machine learning and optimal control for (i) quantifying and classifying colloidal self-assembly system states, (ii) learning tractable stochastic dynamical models of colloidal self-assembly dynamics, and (iii) learning control policies that dynamically change external actuators to guide colloidal self-assembly. Jared was recognized for his thesis work in 2021 by being named a Director's Student Presentation Award Finalist for the Computing & Systems Technology Division (CAST) of the American Institute of Chemical Engineers (AIChE). Jared's research at UC Berkeley was supported by the Achievement Rewards for College Scientists (ARCS) Fellowship. Prior to UC Berkeley, Jared worked at Theranos for three years as a Systems Integration and Validation Engineer and Team Lead. Prior to Theranos, Jared earned a B.S. in Chemical Engineering with Honors and Distinction from Stanford University, where he won the Michel Boudart Award for Overall Excellence and the Channing Robertson Outstanding Junior Awards from Stanford’s Chemical Engineering department. Currently, Jared is the CEO and Co-Founder of SirenOpt, a seed-stage start-up
company that makes a real-time micro- and nano-materials metrology platform based on cold atmospheric plasmas. Through SirenOpt, Jared is a 2023 Activate Berkeley Fellow, which allows Jared and SirenOpt to actively collaborate with the Lawrence Berkeley National Lab. Outside of engineering, Jared enjoys watching football and basketball, attending concerts, and playing board games. Jared was born in Oakland, CA and was raised in nearby Contra Costa County.

Ali Mesbah is an Associate Professor of Chemical and Biomolecular Engineering at the University of California at Berkeley. Before joining UC Berkeley, Dr. Mesbah was a senior postdoctoral associate at MIT. He holds a Ph.D. degree in Systems and Control and a Master’s degree in Chemical Engineering, both from Delft University of Technology. Dr. Mesbah is a senior member of the IEEE and AIChE. He serves on the Editorial Boards of the IEEE Transactions on Control Systems Technology, IEEE Control Systems Letters, and IEEE Transactions on Radiation and Plasma Medical Sciences. Dr. Mesbah is recipient of the Alexander von Humboldt Research Fellowship in 2023, the Best Application Paper Award of the IFAC World Congress in 2020, the AIChE’s 35 Under 35 Award in 2017, the IEEE Control Systems Outstanding Paper Award in 2017, and the AIChE CAST W. David Smith, Jr. Publication Award in 2015. His research interests lie at the intersection of optimal control, machine learning, and applied mathematics, with applications to learning-based analysis, optimization, and predictive control of materials processing and manufacturing systems.

Abhishek Halder is an Associate Professor in the Department of Aerospace Engineering at Iowa State University, and a Visiting Associate Professor in the Department of Applied Mathematics at University of California (UC) Santa Cruz, USA. He served as an Assistant Professor in the Department of Applied Mathematics, and an affiliated faculty in the Department of Electrical and Computer Engineering at UC Santa Cruz. Before that he held postdoctoral positions in the Department of Mechanical and Aerospace Engineering at UC Irvine, and in the Department of Electrical and Computer Engineering at Texas A&M University. He obtained his Bachelors and Masters from Indian Institute of Technology (IIT) Kharagpur in 2008, and Ph.D. from Texas A&M University in 2014, all in Aerospace Engineering. His research interests are in stochastic systems, control and optimization with application focus on large scale cyber-physical systems. He is a co-founder of the annual NorCal Control Workshop that
brings together systems-control researchers from academia and industry in the Northern California region fostering collaboration and professional networking. He is the creator and instructor for the course "Feedback Control" in the California State Summer School for Mathematics & Science (COSMOS) which teaches feedback control theory to 8-11 graders without using calculus or linear algebra. His research with students and collaborators has been recognized with several awards including Applied Mathematics Research Award from UC Santa Cruz, Outstanding Doctoral Student Award from Texas A&M University, and Best Dual Degree Thesis Award from IIT Kharagpur. Abhishek is a Senior Member of IEEE.
O. Hugo Schuck Best Paper Award (Theory)

Xiangyuan Zhang, Bin Hu, Tamer Basar
"Learning the Kalman Filter with Fine-Grained Sample Complexity," 2023 ACC Proceedings, pp. 4549-4554.

Xiangyuan Zhang is a Ph.D. Candidate in the Department of Electrical and Computer Engineering at the University of Illinois Urbana-Champaign (UIUC), advised by Prof. Tamer Başar. He obtained a B.S. degree in Computer Engineering from UIUC in 2020. His research aims to integrate control theory, reinforcement learning, optimization, and game theory to enable large-scale intelligent autonomy. Xiangyuan received an IEEE CDC Outstanding Student Paper Award (2023), an IFAC World Congress Young Author Prize Honorable Mention (2023), an IPIN Best Student Paper Award Finalist (2018), and several fellowships at UIUC. He spent summers at Apple and Mitsubishi Electric Research Laboratories.

Bin Hu serves as an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Illinois Urbana-Champaign (UIUC) and holds an affiliation with the Coordinated Science Laboratory. His research is dedicated to establishing fundamental connections between control and machine learning. His current areas of interest include: 1) system and control tools for the robustness and safety of large foundation models, 2) the interplay between large language models and control, 3) the connections between robust control and reinforcement learning, and 4) control-theoretic tools for the analysis and design of iterative algorithms in optimization and learning. Bin earned his B.S. degree in Theoretical and Applied Mechanics from the University of Science and Technology of China in 2008, and his M.S. degree in Computational Mechanics from Carnegie Mellon University in 2010. He received his Ph.D. in Aerospace Engineering and Mechanics from the University of Minnesota in 2016. Between July 2016 and July 2018, Bin worked as a postdoctoral researcher in the Wisconsin Institute for Discovery at the University of Wisconsin-Madison. In 2021, Bin received the NSF CAREER award and the Amazon Research Award.
Tamer Başar has received B.S.E.E. from Robert College, Istanbul, and M.S., M.Phil, and Ph.D. degrees in engineering and applied science from Yale University. After stints at Harvard University, Marmara Research Institute (Gebze, Turkey), and Boğaziçi University (Istanbul), he joined the University of Illinois Urbana-Champaign (UIUC) in 1981, where he is currently Swanlund Endowed Chair Emeritus, CAS Professor Emeritus of ECE, and Research Professor at CSL and ITI. At Illinois, he has served as Director of the Center for Advanced Study (2014-2020), Interim Dean of Engineering (2018), and Interim Director of the Beckman Institute (2008-2010). He is a member of the US National Academy of Engineering and a Fellow of the American Academy of Arts and Sciences; and Fellow of IEEE, IFAC, SIAM, and AAAI. He has served as President of the IEEE CSS, Founding President of the International Society of Dynamic Games (ISDG), and President of AACC. He has received several awards and recognitions over the years, including the IEEE CSS Bode Lecture Prize (2004), IFAC’s Quazza Medal (2005), AACC’s Bellman Control Heritage Award (2006), ISDG’s Isaacs Award (2010), the IEEE Control Systems Technical Field Award (2014), Medal of Science of Turkey (1993), IEEE Millennium Medal (2000), and Wilbur Cross Medal from Yale University (2021). He has also received honorary doctorates and professorships from a number of international institutions, including KTH Royal Institute of Technology (Stockholm); Tsinghua, Shandong, and Northeastern Universities (China); Boğaziçi and Doğuş Universities (Istanbul); and NAS of Azerbaijan. He was Editor-in-Chief of the IFAC Journal Automatica between 2004 and 2014, and is currently editor of several book series. He has contributed to the fields of systems, control, communications, optimization, networks, and dynamic games, and has current research interests in stochastic teams, games, and networks (with finite- and infinite-population models); multi-agent systems and learning; data-driven distributed optimization; epidemics modeling and control over networks; strategic information transmission, spread of disinformation, and deception; security and trust; energy systems; and cyber-physical systems.
CONFERENCE INFORMATION

REGISTRATION

Registration is mandatory for all conference and workshop participants. Personal badges will be provided to identify registered participants. On-site registration and registration packet pick-up for all advanced registrations may be done at the conference registration desk. The Registration Desk is scheduled to be open during the following hours:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Monday, July 8</td>
<td>12:00 – 17:00</td>
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<tr>
<td>Tuesday, July 9</td>
<td>8:00 – 19:00</td>
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<tr>
<td>Wednesday, July 10</td>
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<tr>
<td>Thursday, July 11</td>
<td>8:00 – 17:00</td>
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<tr>
<td>Friday, July 12</td>
<td>8:00 – 16:00</td>
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Included in the three-day conference registration fee is full access to the conference technical program, including access for downloading the conference proceedings; tickets to the opening and closing receptions; coffee break refreshments; and access to a mobile-friendly technical program with links to papers and available videos. Member and Non-Member registration also includes the conference banquet. Registration fees are shown in the table below. Registrants who are members of any of the American Automatic Control Council Societies (AIAA, AIChE, ASCE, ASME, IEEE, INFORMS APS, ISA, SCS and SIAM) may register at the Member rate.

<table>
<thead>
<tr>
<th>Registration Categories</th>
<th>Advance Registration Fee (by June 1st)</th>
<th>On-Site or after June 1st Registration Fee</th>
<th>Proceedings (Access)</th>
<th>Dinner Banquet</th>
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<tbody>
<tr>
<td>Member</td>
<td>$540</td>
<td>$650</td>
<td>Included</td>
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<tr>
<td>Non-Member</td>
<td>$680</td>
<td>$790</td>
<td>Included</td>
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<tr>
<td>Student/Retiree</td>
<td>$270</td>
<td>$325</td>
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<tr>
<td>One day registration</td>
<td>$400</td>
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Conference proceedings can be purchased for $15 on a USB drive. Printed Full Program Booklet (including detailed information for all sessions and papers): $15 Additional conference banquet tickets can be purchased for $120. Paper upload for authors is available only with Member and Non-Member registration; up to 4 papers can be uploaded for each registration.
Workshop registration fees are shown in the table below.

<table>
<thead>
<tr>
<th>Registration Categories</th>
<th>Advanced Registration (until June 1st)</th>
<th>On-site Registration (after June 1st)</th>
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<tr>
<td></td>
<td>Member/Non-member</td>
<td>Student/Retiree</td>
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<tr>
<td>Full day workshop</td>
<td>$240</td>
<td>$120</td>
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<tr>
<td>Half day workshop</td>
<td>$130</td>
<td>$65</td>
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</table>
INTERNET ACCESS
Basic wireless internet access is available free of charge in all conference and meeting rooms.

COFFEE BREAKS
Coffee breaks will be held in the Dockside Foyer, Pier/Harbour Foyer, and the Frontenac area as follows:

- Wednesday: 9:30 – 10:00 and 15:00 – 15:30
- Thursday: 9:30 – 10:00 and 15:00 – 15:30
- Friday: 9:30 – 10:00 and 15:00 – 15:30

EXHIBITS
Please take time during the conference to visit our exhibitors in the Frontenac area! Please refer to the Sponsors page for more details.

OPENING RECEPTION
Tuesday July 9, 18:30 – 20:30, Harbour Ballroom

PLENARY SESSIONS
Wednesday, Thursday, and Friday morning plenaries will be held between 8:30 – 9:30 in the Metro Ballroom. On Thursday, the Eckman Plenary will be held between 10:00 – 11:00 in the Metro Ballroom.

AWARDS CEREMONY
Thursday July 11, 11:45 – 12:45, Frontenac Ballroom

All conference attendees are encouraged to attend the announcements of the annual AACC and ACC awards. Come celebrate accomplishments in our field!
CONFERENCE BANQUET

Thursday July 11, 18:30 – 21:30, Royal Ontario Museum

The Royal Ontario Museum (ROM), located at 100 Queens Park, Toronto, is ~3.5km from the conference hotel. The easiest way to get there is using the Subway, which will take approximately 20 minutes door-to-door:

1. Walk from the Westin Harbour Castle to Union Station (700m walk)
2. Take the Yonge-University Line to Museum Station (5 stops)
3. Exit onto Queen's Park and cross the street to enter the ROM

The fare is $3.30 CAD, and payment with credit card or Apple Pay is accepted.

Union Station can also be reached from the hotel using the 510A (Spadina to Union Station) streetcar. For this, walk 100m to the Queens Quay/Ferry Docks Station, and then ride the streetcar one stop to Union station. A map that shows the subway route is provided below.

Alternatively, attendees can use Uber/Lyft or a Taxi, costing around $15 CAD and taking 20–25 minutes during rush hour.

A banquet ticket is included with the registration packets for Member and Non-Member registrants. Additional conference banquet tickets can also be purchased for $120 USD each. Children under 4 are free.
**CLOSING RECEPTION**
Friday July 12, 18:30 – 20:30, Harbour Ballroom

**DEPENDENT CARE REIMBURSEMENT**
The American Automatic Control Council (AACC) offered funds to partially offset the expense of dependent care for registrants at the American Control Conference (ACC) 2024. Funds were allocated not to exceed $500 per applicant. Highest priority was given to conference registrants who are presenting a paper(s), or in a workshop or special session. See the conference website for more information.
VENUE AND LOCAL INFORMATION

The 2024 ACC takes place at the Westin Harbour Castle, located on the waterfront in downtown Toronto. The hotel is within walking distance of many of Toronto’s most popular sites, including the CN Tower, the St. Lawrence Market, the Toronto theater district, the Toronto Blue Jays Ballpark, the Distillery District, and vibrant and diverse neighborhoods like Kensington Market. All presentations and meetings are held in the conference hotel.

Toronto is Canada’s largest city and the 4th most populous city in North America. Located along Lake Ontario’s northwestern shore, Toronto is a world leader in business, finance, technology, entertainment, and culture. Its large population of immigrants from all over the globe has also made Toronto one of the most multicultural cities in the world.

Toronto is easy to get around, with the subway running through the downtown core, and a network of streetcars to help you access the varied neighborhoods. Come and explore the city, from the financial district to upscale shopping in Yorkville, to the eclectic mix of bars and coffee shops in Kensington Market. Attendees are encouraged to enjoy the city and surrounding area with their family members. Due to its patchwork of urban parks, Toronto is known as “a city within a park.” Attractions include High Park, which spans over 400 acres, and Toronto Island Park, accessible by ferry from downtown. The city has a booming food scene and has been ranked the most diverse food scene worldwide.
TRANSPORTATION

Most attendees will fly into Toronto Pearson International Airport (YYZ), which has non-stop service to over 155 destinations worldwide. From there, transportation to the conference is straightforward: the UP Express train is a 25-minute ride to Union Station in downtown Toronto, and it runs every 15 minutes. Alternatively, one can take a 30-minute Taxi or Uber directly to the conference venue.

An alternative for some attendees is the Billy Bishop Toronto City Airport (YTZ), which has non-stop flights to over 20 destinations in Canada and in the United States. This airport is just 2km from the conference hotel and can be accessed via Taxi/Uber, the 509 Harbourfront Eastbound streetcar, or directly walking.
EXHIBITORS AND SPONSORS

ACC 2024 thanks all of our sponsors for their generous support of our conference. Many of our sponsors will have exhibits at the conference that we encourage everyone to visit. Exhibits will be open 8:00 to 17:00 on Wednesday and Thursday and 8:00 to 12:00 on Friday.

GOLD SPONSORS

Boeing
Boeing is the world’s largest aerospace company and leading manufacturer of commercial jetliners and defense, space and security systems. A top U.S. exporter, the company supports airlines and U.S. and allied government customers in 150 countries. Boeing products and tailored services include commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training.

Elsevier
Elsevier is a global information analytics business that helps scientists and clinicians to find new answers, reshape human knowledge, and tackle the most urgent human crises. For 140 years, we have partnered with the research world to curate and verify scientific knowledge. Today, we’re committed to bringing that rigor to a new generation of platforms. Elsevier provides digital solutions and tools in the areas of strategic research management, R&D performance, clinical decision support, and professional education; including ScienceDirect, Scopus, SciVal, ClinicalKey and Sherpath. Elsevier publishes over 2,500 digitized journals, including The Lancet and Cell, 39,000 e-book titles and many iconic reference works, including Gray’s Anatomy. Elsevier is part of RELX, a global provider of information-based analytics and decision tools for professional and business customers.
Halliburton
Halliburton is one of the world’s leading providers of products and services to the energy industry. Founded in 1919, we create innovative technologies, products, and services that help our customers maximize their value throughout the life cycle of an asset and advance a sustainable energy future. We combine technology, services and execution expertise to assist our customers with hydrocarbons location, geological data management, drilling and formation evaluation, well construction and completion, and production optimization throughout the life of their asset.

MathWorks
The MATLAB and Simulink product families are fundamental applied math and computational tools at the world’s educational institutions. Adopted by more than 6,500 universities and colleges, MathWorks products accelerate the pace of learning, teaching, and research in engineering and science. MathWorks products help prepare students for careers in industry worldwide, where the tools are widely used for data analysis, mathematical modeling, and algorithm development in collaborative research and new product development. Application areas include data analytics, mechatronics, communication systems, image processing, computational finance, and computational biology.

Mitsubishi Electric
Mitsubishi Electric Research Laboratories (MERL), located in Cambridge, MA, is the North American R&D organization for Mitsubishi Electric Corporation, a $40B global manufacturer of electrical products including elevator and escalators, HVAC systems, electrical power systems, satellites, factory automation equipment, automotive electronics and visual information systems. Controls researchers at MERL collaborate with corporate R&D laboratories, business units in Japan and academic partners around the world to develop new control algorithms and control technologies that extend the capabilities and the performance envelope of these systems.

For students who are interested in pursuing an exciting summer of research, please check out our internship program and learn more on our Website, Facebook, LinkedIn or @MERL_news.
MERL interns work closely with top researchers, and gain valuable industry experience – at an impressive 1:1 intern to researcher ratio. Internships are expected to lead to publications in major conferences and journals. We also recently started a PostDoc program. For PhD graduates interested in applying please see our website www.merl.com

We offer competitive compensation and relocation assistance. Boston is a fantastic student-oriented city, home to some of the best universities in the world.

The summer season is especially lively as MERL and Boston are teeming with researchers and visitors from all over the world.

**Quanser**

Quanser is the world leader in innovative technology for engineering education and research. With a heritage in creating leading-edge platforms for controls, mechatronics, and robotics, Quanser has built a legacy over the past 35 years of transformational solutions that bring emerging technologies including autonomous robotics, IoT, self-driving, and virtual reality to students worldwide. Quanser is unique as the only commercial organization that offers a comprehensive, academically sound platform for delivering programs that push the boundaries of traditional engineering education and research. Through a wide network of academic partners and faculty equivalent researchers and course designers, Quanser works with institutions to solve the challenges of modern engineering as true colleagues as opposed to conventional vendors.
SILVER SPONSORS

General Motors
We envision a future of zero crashes, zero emissions and zero congestion, and we have committed ourselves to leading the way toward this future. General Motors has been pushing the limits of transportation and technology for over 100 years. Today, we are in the midst of a transportation revolution. And we have the ambition, the talent and the technology to realize the safer, better and more sustainable world we want. As an open, inclusive company, we’re also creating an environment where everyone feels welcomed and valued for who they are. One team, where all ideas are considered and heard, where everyone can contribute to their fullest potential, with a culture based in respect, integrity, accountability and equality. Our team brings wide-ranging perspectives and experiences to solving the complex transportation challenges of today and tomorrow. At General Motors, innovation is our north star. As the first automotive company to mass-produce an affordable electric car, and the first to develop an electric starter and air bags, GM has always pushed the limits of engineering. We are General Motors. We transformed how the world moved through the last century. And we’re determined to do it again as we redefine mobility to serve our customers and shareholders and solve societal challenges.

Multidisciplinary Digital Publishing Institute (MDPI)
A pioneer in scholarly, open access publishing, MDPI has supported academic communities since 1996. Based in Basel, Switzerland, MDPI has the mission to foster open scientific exchange in all forms, across all disciplines. Our 437 diverse and open access journals, including 428 peer-reviewed journals and 9 conference journals, are supported by more than 295,000 academic experts who share our mission, values, and commitment to providing high-quality service for our authors. We serve scholars from around the world to ensure the latest research is freely available and all content is distributed under a Creative Commons Attribution License (CC BY).
**Society for Industrial and Applied Mathematics (SIAM)**
SIAM publishes textbooks and monographs in print and electronic format. Visit our booth to browse our titles, all available at discounted conference pricing. SIAM partners with authors to publish books of outstanding quality and accessible pricing. If you’re interested in writing a book, please contact SIAM Executive Editor greenspan@siam.org. More info: https://www.siam.org/Publications/Books.

**Unitree Robotics**
UNITREE ROBOTICS, established in 2016, promoted robots to the global market in 2017. Unitree was one of the earliest manufacturers of quadruped robots in the world, and an outstanding pioneer in the marketization of global high-performance quadruped robots who is fully committed to promoting mobile robots to truly enter people's lives. With self-developed core components, motion control algorithms, robot perception system, and other self-developed technologies, Unitree Robotics has cooperated with a number of top universities and industry-leading technology enterprises. It not only provides customers with technical support such as software development and mechanical programming, but also helps customers configure a lot of external equipment. Quadruped robots have been used in many application scenarios such as security inspection, ground exploration, and detection. At present, hundreds of brands are equipped with Unitree quadruped robot, and many application areas such as petrochemical, security, electric power and education use the mature product solutions and technical support of Unitree Robotics.

**Wiley**
Wiley champions those who see knowledge as a force for good. A trusted leader in research and learning, our pioneering solutions and services are paving the way for knowledge seekers as they work to solve the world’s most important challenges. Around the globe, we break down barriers for innovators, empowering them to publish and advance discoveries in their fields, evolve their workforces, and shape minds through teaching and learning. Together, we are unlocking the creation and curation of knowledge for all, transforming today’s biggest obstacles into tomorrow’s brightest opportunities.
Whether you're already publishing your work or have ever considered it, we can help you achieve your goals. Why should I publish? Where should I publish? What topics are hot? Wiley book acquisitions editor Lisa McClain is available at ACC 2024 to answer all your questions. You can also email Lisa at emcclain@wiley.com if you don’t have time to stop by!
Franklin Open
Franklin Open is a peer-reviewed, gold open-access journal that focuses on the fields of engineering and applied mathematics. Franklin Open is a partner journal to the longstanding Journal of The Franklin Institute, which has been publishing scientific research and discoveries for almost 200 years. The journal was created to not only continue that legacy, but to provide a sustainable platform for new research to be widely disseminated from all voices in the scientific and academic communities. Franklin Open aims to publish high-quality manuscripts under such topics as, Complex Networks & Cyber-Physical Systems, Control Engineering & Robotics, Energy & Power Systems, Information & Communications, Data Science & Artificial Intelligence, Neural Networks & Learning Systems, and Speech, Image, & Signal Processing. We welcome new submissions as well as special issue proposals through our website. If you have any questions, please contact franklinopen@fi.edu.

Robust Engineering Systems
Our firm Robust Engineering Systems, LLC (referred to as RES going forward) developed a software named TAACSD Tool-Box (Transformation Allergic Approach Control Systems Design Tool-Box) which offers an innovative, new and novel, pure State Space MIMO based approach to design highly robust control systems much different from the current literature eigenvalue based MATLAB Control Systems Design Tool-Box designs being offered by the Mathworks company. The RES developed TAACSD Tool-Box, uses a US patent awarded (patent number 11,815,862 awarded in November 2023) Transformation Allergic (TA) Approach. It does not use eigenvalues as state variable convergence measures but instead uses Transformation Allergic Indices, which are always real scalars. RES developed TAA CSD Tool-Box offers much improved robustness to various uncertainties/perturbations such as real parameter variations, unmodeled dynamics, and accommodates time varying perturbations as well as multiple equilibrium points and errors in guidance commands and initial conditions together. TAA CSD Tool-Box assumptions are much different from the MATLAB CSD Tool-Box. Application areas of TAA CSD Tool-Box include Aero
SPECIAL SESSIONS

In addition to the main technical program, the conference includes breakfast-time, lunch-time, and evening special sessions on industry, outreach, education, family-friendly topics, emerging topics, and funding opportunities.

WEDNESDAY SPECIAL SESSIONS

Early Career Welcome Breakfast

Organizer: Anastasia Bizyaeva, Erfan Noorani, Jeffrey Chen, Philip Paré
Time: 7:30 – 8:30 Wednesday, July 10, 2024
Location: Pier 2

Graduate students, postdoctoral scholars, and early career researchers are warmly invited to a special breakfast session designed to kick off the first full day of the conference in a friendly and informal setting. This breakfast will be a perfect opportunity to meet new peers and to make a game plan for your conference agenda. It is also a chance to meet members of the newly formed NextCom committee within the Control Systems Society and learn about upcoming resources, workshops, and networking opportunities aimed at supporting early career members of our community.
Family-Friendly Session: STEM-Themed Animated Shorts and Games

Organizer: Helen Durand
Time: 10:00 – 11:30 Wednesday, July 10, 2024
Location: Dockside 1

This family-friendly session will consist of showing a STEM-related short story intended to be enjoyable by both older and younger audiences, followed by STEM-related games. This content will last approximately 30 minutes, repeated 3 times so that people can come through to enjoy it or repeat it. The age range being targeted will be preschool/pre-K to early elementary age range, though older audiences are also welcome and may enjoy the events. Parents or guardians are required to be present and always supervise their children.

An Overview of NSF Programs

Organizer: Yue Wang and Jordan Berg
Time: 11:00 – 12:30 Wednesday, July 10, 2024
Location: Pier 2

The National Science Foundation (NSF) offers multiple funding opportunities for investigators working in the field of controls, both within disciplinary programs in Engineering and other directorates, and through foundation-wide cross-cutting initiatives. This presentation will describe opportunities that are relevant to the robotics, dynamics and controls communities. The presentation will also describe programs targeted toward junior investigators, as well as guidelines for proposal preparation and NSF’s Intellectual Merit and Broader Impacts criteria. A question-and-answer session will follow the presentation.
Elsevier: How to get published - first steps in getting your work published in journals

Organizer: Kay Tancock
Time: 11:30 – 12:30 Wednesday, July 10, 2024
Location: Queen’s Quay 1

A guide to publishing within Elsevier's control and systems portfolio of journals for early career researchers. The session will elaborate on the most efficient ways of submitting a paper and give Early Career Researchers tips and tricks to ensure their research is more likely to be accepted. It will also include a 'Meet the Publisher' event where researchers can ask their publishing questions one-on-one with the publisher.

Social Justice and Control Theory: Bridging Engineering and Equity

Organizer: Satadru Dey, Damoon Soudbakhsh, Polina Ringler, Ankush Chakrabarty, Stephanie Stockar
Time: 11:30 – 12:30 Wednesday, July 10, 2024
Location: Dockside 2

A panel on "Social Justice and Control Theory" can provide a platform for discussing the intersection of control theory, engineering, and societal concerns related to equity, fairness, and social justice. The panel features experts from various fields, including control theory, engineering, ethics, and social justice advocacy. The objective is to help bridge the gap between the technical aspects of control theory and the ethical and societal considerations needed to ensure that control systems and technology contribute to a more equitable and just society. Furthermore, it should inspire collaboration and encourage engineers and technologists to integrate social justice in their work.
Tackling Control Problems with Open-Source Software in Julia and Python

Organizer: Jan Drgona, LaGrande Gunnell, Joshua Pulsipher, John Hedengren
Time: 11:30 – 13:00 Wednesday, July 10, 2024
Location: Bay

This 1.5-hour session will feature three informal tutorials (30 minutes each) that highlight the capabilities of prominent open-source software packages for posing and solving control problems in Python and Julia, namely NeuroMANCER, Gekko, and InfiniteOpt. These each will be led by a core developer of each package. In the context of control, NeuroMANCER provides a differentiable programming library for parametric model-based optimal control, Gekko provides optimization and machine learning methods for rigorous nonlinear model predictive control, and InfiniteOpt provides a flexible optimization interface for posing optimal control problems with uncertainty and novel modeling objects.

Women in Control Luncheon

Organizer: Afef Fekih and Dennice Gayme
Time: 12:00 – 13:30 Wednesday, July 10, 2024
Location: Pier 4 and Pier 5

The Women in Control Committee (WiC) is dedicated to empowering and promoting gender diversity in the Control Systems Society (CSS) by facilitating the development of mentoring and programs to promote the retention, recruitment, and growth of women CSS members. The WiC luncheon at ACC 2024 in Toronto, Canada provides the opportunity to network, discuss women's roles in CSS, inspire the next generation of female leaders, and foster collaborations to advance women's leadership. This special session will provide female researchers and professionals with the invaluable opportunity to network, seek guidance, and engage with senior faculty members and industry leaders.
Student Networking Event

Organizer: Mugdha Basuthakur, Chantel Lapins, Yasmine Marani, Sasha McKee, Jacob Anderson
Time: 17:30 – 19:30 Wednesday, July 10, 2024
Location: Metro W

The Student Networking special session aims to provide all interested students attending ACC 2024 the opportunity to receive valuable career advice from experts in industry, academia, and national laboratories. Moreover, it seeks to enhance student engagement in the conference and promote awareness of the benefits of involvement in the control community by offering a platform that facilitates connections with peers and the attending professionals. In the first 25 minutes of this structured event, the invited professionals will present their backgrounds and areas of interest.

This will be followed by 3 rounds of rotating round-table conversations where, in each round, 7-8 students will have the opportunity for open discussion with a professional for 20 minutes before moving to another table. The final 30 minutes are reserved for open social networking to allow students to connect with peers and the remaining invited professionals with whom they did not interact during the round-table discussions. An assortment of snacks will be provided!
THURSDAY SPECIAL SESSIONS

Student Breakfast (Part I): Security and Privacy of the Next-Generation Cyber-Physical Systems

Organizer: Sribalaji Coimbatore, Tao Li, Aris Kanellopoulos, Christos Mavridis, Dipankar Maity

Time: 7:30 – 8:30 Thursday, July 11, 2024
Location: Dockside 1

Students and early-career researchers are warmly invited to special breakfast sessions on Thursday and Friday. Sponsored by the Technical Committee on Security and Privacy, the student-organized sessions will explore a new landscape of cyber-physical systems (CPS) research by bringing together young scholars working on the security and privacy of CPS and their applications in diverse areas. In addition to technical presentations, this student-organized workshop features a panel discussion and experience-sharing mixer on academic job-seeking and career development. The primary objective of these sessions is to engage early-career researchers from multiple topical areas in control society and create a vibrant and sustainable research thrust dedicated to the security, privacy, and resiliency of the next-generation cyber-physical systems.
Getting Funded by NSF: Proposal Preparation and the Merit Review Process

Organizer: Yue Wang and Jordan Berg
Time: 11:30 – 13:15 Thursday, July 11, 2024
Location: Bay

So, you think you have a great research idea, now how do you get funding from the National Science Foundation (NSF) to do the work? A well-scoped and written proposal is instrumental to successful submission. This session targets junior faculty and researchers who might be new to NSF and describes detailed guidelines and practical advice for proposal preparation. The presenter will go over NSF review process and Intellectual Merit and Broader Impacts criteria, as well as share most common mistakes made by the Primary Investigators when submitting a proposal. Question-and-answer session will follow the presentation.

Fostering Justice, Diversity, Equity, and Inclusion (JEDI) in the Controls Community

Organizer: Victor Zavala and Karen Rudie
Time: 11:30 – 12:30 Thursday, July 11, 2024
Location: Queen’s Quay 1

This session will aim to bring together students and researchers from industry and academia to discuss ideas on how we can promote Justice, Diversity, Equity, and Inclusion (JEDI) in the control field, as a way to foster representation and a sense of belonging for all members of the controls community. The session will involve a panel composed of researchers, who will share their experiences in promoting JEDI initiatives. All members of the ACC community, including underrepresented minorities, and welcome to attend this event.
How to Make a STEM Outreach Film

Organizer: Helen Durand
Time: 11:30 – 12:30 Thursday, July 11, 2024
Location: Dockside 1

This session will discuss the use of film in STEM outreach. We will cover our experience with topics such as: 1) how to start such a film; 2) how to see if the film is “working”; 3) how to move into the animation process (even if you are not an artist). We will discuss potentially useful software as well as aspects of the editing process. We will focus on filmmaking in the case of wanting to tell a story where STEM plays a role in the plot, but the film is not directly a tutorial on STEM concepts (i.e., indirect teaching of STEM through the plot and characters).

The Boeing Company

Organizer: Kevin Wise, Heather Hussain, Mark Ward, Joseph Gaudio, Ryan Ratliff
Time: 12:00 – 13:15 Thursday, July 11, 2024
Location: Queen’s Quay 2

As a leading global aerospace company, Boeing develops, manufactures and services commercial airplanes, defense products and space systems for customers in more than 150 countries. As a top U.S. exporter, the company leverages the talents of a global supplier base to advance economic opportunity, sustainability and community impact. Boeing’s diverse team is committed to innovating for the future, leading with sustainability, and cultivating a culture based on the company’s core values of safety, quality and integrity. Join our team and find your purpose at boeing.com/careers. Boeing wants to get to know you and what legacy you want to create that will change the world. Come to the Boeing special session and meet the team!
Industry Lunch: MERL: Fundamental Research with Real-World Impact

Organizer: Stefano Di Cairano, Karl Berntorp, Abraham Vinod, Avishai Weiss
Time: 12:00 – 13:15 Thursday, July 11, 2024
Location: Pier 2

Mitsubishi Electric Research Laboratories (MERL) is a leading research organization that conducts fundamental research for industrially motivated problems. MERL is a subsidiary of Mitsubishi Electric Corporation, a global manufacturer of a wide range of products including robots, automotive, HVAC, factory automation, electrical systems, and space systems. MERL researchers collaborate with corporate laboratories and academic partners from around the world to develop novel solutions to challenging problems.

In this talk we present an overview of research activities at MERL, including fundamental research in control and its application to a variety of future products. We discuss fundamental research including model predictive control and control of constrained systems, estimation and motion planning for autonomous systems, real-time optimization and integration of learning and control. Then, we describe how these fundamental research areas have impacted real world applications and products such as automated vehicles, drones, spacecraft, robots and navigation systems.

Students and faculty interested in collaborations and ideas exchange are encouraged to attend.
FRIDAY SPECIAL SESSIONS

Student Breakfast (Part II): Security and Privacy of the Next-Generation Cyber-Physical Systems

Organizer: Sribalaji Coimbatore, Tao Li, Aris Kanellopoulos, Christos Mavridis, Dipankar Maity
Time: 7:30 – 8:30, Friday, July 12, 2024
Location: Dockside 1

Students and early-career researchers are warmly invited to special breakfast sessions on Thursday and Friday. Sponsored by the Technical Committee on Security and Privacy, the student-organized sessions will explore a new landscape of cyber-physical systems (CPS) research by bringing together young scholars working on the security and privacy of CPS and their applications in diverse areas. In addition to technical presentations, this student-organized workshop features a panel discussion and experience-sharing mixer on academic job-seeking and career development. The primary objective of these sessions is to engage early-career researchers from multiple topical areas in control society and create a vibrant and sustainable research thrust dedicated to the security, privacy, and resiliency of the next-generation cyber-physical systems.
Feedback Screening of "Independence"

Organizer: Helen Durand  
Time: 10:15 – 13:15, Friday, July 12, 2024  
Location: Dockside 1

In this session, attendees will be able to watch a full-length film being created by Dr. Helen Durand called “Independence.” The film is a science fiction adventure. Dr. Lucas is at ethical odds with a number of colleagues due to his experiments in finding ways to mark the offenses of individuals against programmed moral standards, supposedly to improve their lives. Dr. Lucas’ research ideas at the intersection of science and morality have caused Dr. Fuertes serious issues. He is living a life of deception to avoid nearing death, trying to find some way to make up for his past and become free. This film may be appropriate for teenagers and above due to scientific discussions (with significant artistic liberty) and also violence in plot points, including murder, harm, and peril. This is an initial version of the script that will be presented in stop motion or storyboard format and is in the development stage. Your feedback is welcome. Get ready for moral values meets eigenvalues.

Navigating the Landscape of Innovation: Insights from Industry and Consulting

Organizer: Shreshta Rajakumar Deshpande and Yan Chen  
Time: 11:30 – 12:30, Friday, July 12, 2024  
Location: Bay

The dynamic landscape of innovation, research, and product delivery continuously evolves, presenting us with valuable lessons and insights. This special session aims to explore how one's perspective and priorities are influenced by the role they play in the innovation ecosystem: corporate, academic, or startup. The speaker/s will delve into the positive aspects, the challenges, and the less glamorous realities associated with each of these roles. Additionally, strategies for striking a balance between these perspectives will be discussed, to foster a more efficient and effective society.
Key topics of discussion include: shifting perspectives in problem perception and definition, decision-making dynamics in these different contexts, and roadmaps towards productive societal innovation.

**Recent Systems and Control Research in Canada**

**Organizer:** Yang Shi and James Richard Forbes  
**Time:** 11:30 – 13:00, Friday, July 12, 2024  
**Location:** Queen’s Quay 2

Over the years, researchers based in Canada have consistently made substantial contributions to the field of systems and control. This session aims to highlight the recent theoretical and technological breakthroughs achieved by these Canadian scholars and professionals in areas such as control, mechatronics, data analytics, intelligent systems, and automation. Beyond showcasing these innovations, our goal is to foster a platform for Canadian researchers to engage with and gain insights from their peers across institutions. We also hope to stimulate discussions among Canadian experts and their global counterparts, paving the way for potential collaboration.

**Role of Learning and Control in Climate-Resilience of Power Grid**

**Organizer:** Pramod Khargonekar  
**Time:** 11:30 – 13:00, Friday, July 12, 2024  
**Location:** Queen’s Quay 1

Extreme weather events, such as heat waves, cold waves, wildfires, and storms, are increased in intensity, frequency and duration and can have significant impacts on human health, infrastructure (such as power grid) and the environment. Power grids are undergoing massive transformation through large-scale integration of renewable energy resources, and distributed energy resources, while having to be more resilient during extreme weather events. Control and learning methods, not only have contributed to the operation and planning practices of power grids as we
know them today, but also can play even a bigger role in shaping the decarbonized and resilient grid of the future. This session will bring together a group of diverse experts to discuss the opportunities for and challenges of developing and integrating advanced control and learning technologies in the operation and planning of power grid.

**MathWorks Lunch: Asynchronous Engineering Instruction and Increased Teaching Impact**

**Organizer:** Melda Ulusoy, Craig Buhr, Christopher Lum  
**Time:** 12:00 – 13:15, Friday, July 12, 2024  
**Location:** Pier 2

This presentation will discuss various methodologies, challenges, and lessons learned related to teaching an engineering curriculum in an asynchronous fashion (aka a ‘flipped classroom’). This format has demonstrated significant benefits such as increased student engagement, greater flexibility in learning, and broadened impact/reach but simultaneously presents unique challenges such as additional instructor overhead and effort. Presenter will discuss how to encapsulate information and use social media platforms such as YouTube to build an online teaching presence that can be leveraged by students both inside and outside your home university. The discussion will also highlight how MATLAB and Simulink facilitate the teaching of various engineering topics such as controls, flight mechanics, and simulation. It will also discuss the application of these concepts/tools to industry problems. This session strives to provide educators with tools and processes to increase their teaching impact and enable knowledge sharing across a global population.
STUDENT PROGRAMS

STUDENT BEST PAPER AWARD SESSION

All five finalist papers (see below) will be presented during a special session on Wednesday, July 10, 15:30 – 17:30, in Pier 9. The winner will be selected by the Best Student Paper Awards Committee and will be announced at the AACC Awards Ceremony on Thursday, July 11, 11:45 – 12:45, Frontenac Ballroom.

STUDENT BEST PAPER AWARD FINALISTS

The 2024 ACC is pleased to continue the tradition of the Student Best Paper Award. All primary, first-listed authors of a regular contributed paper who were students at the time of submission were eligible. To be considered for the award, the paper was nominated by the student’s advisor in October 2023. The nominated papers were reviewed through the usual conference review process and by the Best Student Award Committee. Based on these reviews, the following five papers were selected as finalists for the Student Best Paper Award competition.

Michael Tang (Student Author), Miroslav Krstic, Jorge I. Poveda. On Fixed-Time Stability for a Class of Singularly Perturbed Systems Using Composite Lyapunov Functions, FrB21.4

Shida Jiang (Student Author), Junzhe Shi, Manashita Borah, Scott Moura. Weaknesses and Improvements of the Extended Kalman Filter for Battery State-Of-Charge and State-Of-Health Estimation, WeC06.4

Charis Stamouli (Student Author), Evangelos Chatzipantazis, George J. Pappas. Structural Risk Minimization for Learning Nonlinear Dynamics, ThC04.5
**STUDENT TRAVEL GRANTS**

The 2024 American Control Conference Organizing Committee offered partial support to students traveling to the 2024 ACC in Toronto.

The following two conditions were required for support:
- The applicant must have been enrolled as a student at the 2024 ACC paper submission deadline (September 30, 2023), and
- The applicant must register for the conference and present a paper.

The application deadline was February 18, 2024.

The ACC 2024 Organizing Committee thanks the National Science Foundation, American Automatic Control Council, Institute of Electrical and Electronics Engineers (IEEE), the American Society for Mechanical Engineers (ASME), Society for Industrial and Applied Mathematics (SIAM) and others for their support of student activities.

**SPECIAL SESSIONS FOR STUDENTS**

Please see details in the Special Sessions section above for the following events:

- **Early Career Welcome Breakfast**, 7:30 – 8:30 Wednesday, July 10, 2024, Pier 2
- **Student Networking Session**, 17:30 – 19:30 Wednesday, July 10, 2024, Metro W
- **Student Breakfast (Part I): Security and Privacy of the Next-Generation Cyber-Physical Systems**, 7:30 – 8:30 Thursday, July 11, 2024, Dockside 1
• **Student Breakfast (Part II): Security and Privacy of the Next-Generation Cyber-Physical Systems**, 7:30 – 8:30, Friday, July 12, 2024, Dockside 1
SELF-DRIVING CAR STUDENT COMPETITION

Location: Regatta Room

Students were encouraged to participate in the Self-Driving Car Student Competition, powered by Quanser, during the 2024 American Control Conference. The competition provides an excellent opportunity for students from around the globe to acquire leading-edge knowledge and develop critical problem-solving skills while also attracting and nurturing next-gen researchers. The competition committee has configured the self-driving challenge to highlight critical Control Systems concepts that will focus on real-time decisions, and feedback control systems that will result in fast and precise driving performance.

The competition was conducted in three stages:

STAGE 1 Virtual Design and Submission
STAGE 2 Algorithm Validation on Physical Vehicles
STAGE 3 On-site Demonstration and Competition

The tasks include but are not limited to: time to complete the path (circuit), accuracy of driving, timely reactions to stop signs and traffic lights, as well as avoidance of obstacles.

July 10, Practice Day, Full day event

- The student teams take this opportunity to practice in the actual competition environment.

July 11, Competition Day, Full day event (Regatta Room)

- 10:00 – 11:30 Team races
- 12:30 – 13:30 Championship and Award Ceremony
TUTORIAL SESSIONS

Tutorial sessions address the development and/or application of state-of-the-art control approaches and theory to real-world engineering applications. We are pleased to offer the following tutorial sessions at ACC 2024:

**WeB08 - Advanced Methods in Diagnostics and Prognostics**

**Organizers:** Ivan Castillo, The Dow Chemical Company  
Zhenyu Wang, Dow Chemical  
Imad Makki, Ford Motor Company

**Time/Location:** 13:30 – 15:00, Wednesday, July 10, 2024, Bay

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<td>Advanced Methods in Diagnostics and Prognostics</td>
<td>Fabian Mohr, Weike Sun, Richard D. Braatz</td>
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<td>14:30-14:45</td>
<td>Prognostics for Chemical Processes</td>
<td>Ivan Castillo, Zhenyu Wang, Leo Chiang</td>
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<tr>
<td>14:45-15:00</td>
<td>Predictive Analytics for Chemical Processes</td>
<td>Joel Paulson</td>
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Fault diagnostics (FD, aka fault detection and identification, FDI) are critical for increasing the reliability and safety of dynamic systems. Fault detection’s main function is to determine whether there are faults or abnormal conditions in the system. The performance of fault detection systems can be evaluated based on fault detection sensitivity and the capability of detection with lower rates of false alarms. The purpose of fault identification is to identify the type of fault (i.e., sensor, actuator, or process), distinguish single and multiple faults, and estimate the size of the fault. FD/FDI systems are useful to monitor process performance and quickly identify the root cause of the issue that ultimately maintains the stability of the system. Fault prognostics aims to predict faults before they occur. The goal of fault prediction is to estimate how soon and how likely the fault will occur. A diverse range of FDI and fault prognostics methodologies can be found in the literature that can be classified into three main categories: first-principles, data-driven, and hybrid approaches. Diagnostics and prognostics have seen increasing applications across different industries, including automotive, batteries and chemical. As each industry deals with different systems (e.g., reactors vs. batteries,
generators vs vehicles), the challenges for each area have their own unique facets in terms of scales, complexity, uncertainty, understanding of physics of failure and data quantity and quality, etc. As a result, the development and deployment of diagnostics and prognostics varies across applications. With success stories shared from different areas, this session provides an exciting opportunity for practitioners to gain broad and deep insights about the landscape of diagnostics and prognostics and inspire them to leverage the success from other areas.

This tutorial session will provide the state-of-art methods involving diagnostics and prognostics especially in batteries, energy, and chemical industry. Perspectives of challenges and future development of diagnostics and prognostics, from both academia and industry, will be covered as well.

**ThB08 - Process Control Evolution and Challenges in Nuclear Power Plants**

**Organizer:** Kevin Yu, Ontario Power Generation

**Time/Location:** 13:30 – 15:00, Thursday, July 11, 2024, Bay

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<td>13:30-14:15</td>
<td>Process Control Evolution and Challenges in Nuclear Power Plants</td>
<td>Kevin Yu, Mark Knutson</td>
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<tr>
<td>14:15-15:00</td>
<td>Load-Following Control of Nuclear Power Plants in the Age of Small Modular Reactors</td>
<td>Zhibo Zhang, Jin Jiang</td>
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This tutorial paper is to present the evolution of the methodology that has guided performance optimization and the design techniques that ensure the robustness of control systems in the nuclear power plants at Ontario Power Generation Inc. The evolution is a true implementation of the design principles that have been pioneered by Canadian nuclear professionals over the past half century and reflects continuous learning, one of the core values in our safety culture, so that we can perform tasks with rigor and certainty. The paper will discuss failure mode and effects analysis by sharing some lessons we learned from our digitalization of some components and equipment. Human factors engineering is a design technique we use to reduce human errors when operators are part of process control loops. While this paper will focus on plant process control systems, our two sister papers will be dedicated to turbine governor control and the coordination between the energy generated from nuclear power plants and the demand from the electrical grid in the context of the Small Modular Reactor.
Workshops

The ACC will offer workshops addressing current and future topics in automatic control from experts in academia, national laboratories, and industry. The workshops at ACC 2024 will take place prior to the conference on July 8 and 9, with lengths varying from full workshops to half-day workshops.

Monday Workshops

W13: Computation for Real World Control Systems

Organizer: Daniel Abramovitch
Time: Monday Afternoon, July 8, 2024
Location: Dockside 3

Computation is an essential component of implementing any real-world control system, but the details of how to make this work are often either left to the individual contributors to figure out or handed off to turn-key vendors. This workshop intends to provide insights, methods, and concrete examples into three major pieces of this subject. First, the workshop will present recent tutorial material (ACC 2023) from the author on real-time computing issues for control systems. This material explains the principal factors affecting the four computing chains inside a feedback system. After this overview, the workshop will spend time on an often-neglected area of computation for control system measurements, whether they be used in the control loop operation or in the system identification used in model building for control. Finally, the workshop will hone in on specific programming methods and components in the controller itself, describing efficient implementation methods and structures. Together these three thrusts should equip the participant with tools that they can apply almost immediately in their work. While the technology of computation constantly changes, the principles that lead any one of those signal chains to be a limiting factor remain the same.
TUESDAY WORKSHOPS

W01: Model-Based Process Control Using First-Principles Models

Organizer: R. Russell Rhinehart
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Location: Pier 8

This full-day workshop has two objectives: 1) For those in research related to control methods the workshop will reveal successful techniques and issues that need to be incorporated in model-based controllers. 2) For those considering implementing first-principles models for control, it will be a practical how-to guide.

W02: Data-Based: the Past and Future of Control?

Organizers: Raman Goyal and Suman Chakravorty
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Pier 3

Data-based control has a long history in the Control community, tracing back to seminal work in adaptive control and system identification. However, much of this past work concentrated, for good reason, on linear time-invariant (LTI) problems. With the rapid advances of Reinforcement Learning (RL) in the past decade, owing partly to the vast increase in computing power, data-based control is enjoying a renaissance and seems poised to advance control synthesis to a slew of new applications that are non-LTI.

W03: Optimal Control in Julia with JuMP and InfiniteOpt

Organizer: Joshua Pulsipher
Time: 8:30 – 17:30, Tuesday, July 9, 2024 One full day
Room: Dockside 9

This workshop is a tutorial on how to model complex nonlinear, continuous-time optimal control problems via InfiniteOpt.jl and JuMP.jl. Leveraging a unifying abstraction for infinite-dimensional optimization (InfiniteOpt) problems, InfiniteOpt.jl is a Julia-based open-source software package that builds upon JuMP.jl to provide an intuitive symbolic modeling environment for many problem classes in dynamic, PDE-constrained, and stochastic optimization. Moreover, its extensibility allows researchers to make their cutting-edge techniques accessible to a wide audience of individuals. All these aspects make InfiniteOpt.jl a powerful tool for tackling advanced optimal control problems.

CANCELLED
W04: Coupled Transportation and Power Networks: New Challenges and Opportunities for Systems, Control, and Learning

Organizers: Junjie Qin and Sivaranjani Seetharaman
Time: Tuesday, July 9, 2024, Half day - afternoon
Room: Dockside 5

As the electrification of transportation becomes a crucial component of sustainable mobility in the future, cities across the globe have set ambitious goals to promote the use of electric vehicles. The increasing penetration of electric vehicles (EVs) altered not only the travel patterns of private car users and fleet operators over the transportation network, but also the power consumption patterns over the distribution power networks, resulting in a tighter coupling between the transportation and power systems.

W05: Physics-informed Machine Learning for Modeling, Control, and Optimization

Organizers: Thomas Beckers, Jan Drgona, Madelyn Shapiro, Draguna Vrabie, Rolf Findeisen, Sandra Hirche
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Pier 5

In recent years, there has been an explosion of research on the intersection of machine learning and classical engineering domains. Machine learning is increasingly being used in the development of novel data-driven approaches for modeling and control of dynamical systems, traditionally dominated by physics-based models and scientific computing solvers. On the other hand, engineering and scientific computing principles are changing the machine learning landscape from purely black-box into domain-aware methods by incorporating more structure and prior knowledge into their model architectures and loss functions.
W06: Advanced Battery Management: Recent Advances and Future Trends

Organizers: Huazhen Fang, Xinfan Lin, Scott Moura, Simona Onori, Ziyou Song

Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Dockside 9

Battery energy storage systems are emerging as the backbone of numerous industrial and civilian applications, serving as pivotal components in transitioning the world toward a clean energy era. Their performance and safety critically rely on advanced battery management techniques, which have garnered significant attention from the research community, particularly in the systems and control domain, over the past decade. These concerted efforts have resulted in remarkable progress, harnessing control theory to enable sophisticated, high-performing battery systems across a wide array of applications.

W07: Advances in Cybermedical Systems: Recent Results on the Modeling and Control of Biological Systems for Medical Applications

Organizers: Amor Menezes and Ali Mesbah

Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Pier 2

Foundational 21st-century control theory advances have helped realize practical cyberphysical systems, captured biological system dynamics both mechanistically and phenomenologically, and developed biosystem regulation at multiple interaction scales, from molecules to organisms. At the intersection of these advances lies the field of cybermedical systems. Cybermedical systems are physical or biological constructs that incorporate automated monitoring, manipulation, and testing of biological systems with programmed knowledge and artificial Intelligence, to achieve a goal of improved human health.
W08: Practical Methods for Real World Control Systems

Organizers: Daniel Abramovitch, Sean Andersson, Craig Buhr
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Dockside 1

A question one should ask of any advanced algorithm is, “How do we make that work in a real system?” A question one should ask of any industrial control system is, “How do we apply better algorithms to this problem?” The two questions are dual sides of the same “bridging the gap” problem that has hounded control for decades. This workshop will examine practical methods that address this problem from both sides: ways to implement advanced algorithms on real systems and ways to improve industrial control using advanced methods.

W09: A Systems Perspective on Automotive Cybersecurity

Organizers: Mohammad Pirani, Walter Lucia, Ehsan Nekouei, Bruno Sinopoli, Karl Henrik Johansson
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Dockside 4

Advancements in embedded systems, sensor technologies, communication devices, and artificial intelligence have resulted in vehicles that are pervasively monitored by dozens of digital computing units coordinated via internal vehicular communication networks. While this evolution in vehicle connectivity has propelled major advancements in driving efficiency, it has also introduced a new range of potential risks, including the unwanted access of third parties with malicious motives which can endanger driving safety. For instance, it has been experimentally demonstrated that bypassing the security mechanisms of a vehicle is not difficult for attackers. Moreover, attackers can also completely erase any evidence of their presence.
W10: Confluence of Learning and Control Approaches in Multi-Agent Systems

Organizers: Aditya Dave, Logan E. Beaver, Heeseung Bang, Andreas A. Malikopoulos
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Pier 9

As the world grows increasingly well connected, multi-agent systems have encompassed many critical applications such as cooperative robots, networked control systems, power systems, autonomous vehicles, mobility markets, smart cities, economic institutions, and online social networks. Typically, a multi-agent system comprises many decision-makers that must either learn to act or compute coordinated actions to achieve the design objective. A key feature of such systems is the need for decentralized decision-making arising from different factors such as restricted communication, computational limits, and requirements of resilience against the failure of any subgroup of agents. Under these conditions, traditional centralized approaches for both optimal control and reinforcement learning are rendered unsuitable. Thus, studying the confluence of the different approaches to learning and control in multi-agent systems has emerged as a crucial area of research and development.

W11: Challenges in Control for the Future of Mobility

Organizers: Gioele Zardini, Carlo Cenedese, Emilio Frazzoli, John Lygeros
Time: 8:30 – 17:30, Tuesday, July 9, 2024, One full day
Room: Dockside 6

Increasing urbanization and exacerbation of sustainability goals threaten the operational efficiency of current transportation systems and confront cities with complex choices with huge impacts on future generations. At the same time, the rise of private, profit-maximizing Mobility Service Providers leveraging public resources, such as ride-hailing companies, entangles current regulation schemes. This calls for tools to study such complex socio-technical problems. In past years, optimization and control played an important role when solving decision-making problems in this space.
W12: Cooperative Output Regulation of Heterogeneous Multi-agent Systems

Organizers: Jie Huang, Changran He, Yamin Yan, Selahattin Burak Sarsilmaz, Ahmet Taha Koru

Time: Half day – afternoon, Tuesday, July 9, 2024
Room: Pier 7

In cooperative control of multi-agent systems, one of the fundamental problems is to design a distributed control law such that the output of every agent asymptotically tracks a class of references and asymptotically rejects a class of disturbances while preserving the closed-loop stability. The term ‘cooperative output regulation’ was coined in the 2010s to refer to this problem. It offers a unifying framework that considers heterogeneity in multi-agent systems, paves the way for a capability of tracking and rejecting a large class of signals, and contains typical cooperative control problems such as leader-following and formation as subcases. The main difficulty here lies in the lack of central authority. In other words, each agent can share information with only their neighbors. From a control theory viewpoint, how should distributed controllers (i.e., local interactions between the agents and control protocols) be structured to ensure that the cooperative output regulation is undertaken?

Bystander Intervention Workshop (Free Registration)

Organizers: Kelley Barsanti, Jay Farrell, Blair Schneider

Time: 9:00 – 12:00 and 14:00 – 17:00 (offered twice), Tuesday, July 9, 2024
Room: Dockside 3

The purpose of this interactive workshop is to build awareness and understanding of exclusionary behaviors and to teach and practice effective bystander intervention in engineering academic and professional settings, as pathways to building culture and climate that promote equity and inclusion. The workshop includes an interactive PowerPoint presentation and breakout groups in which you will discuss and practice bystander intervention approaches in scenarios focused on common academic environments (e.g., faculty meetings and conferences) that are based on actual events. The skills developed in this workshop have usefulness in all aspects of life and work, including faculty and student interactions.

NSF CEAN is a partnership between Bourns College of Engineering (UC Riverside), NSF ADVANCEGeo, and UC College of Engineering Deans Council.
## Late-Breaking News Poster Session

**Thursday, July 11, 11:00-11:45, Metro, Harbour and Frontenac Ballrooms**

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<td>Dynamic Extended-Output Observer Design for an Adaptive Vertical Farm Quadcopter</td>
<td>Chnib, Echrak; Bagnerini, Patrizia; Gaggero, Mauro; Zemouche, Ali</td>
</tr>
<tr>
<td>ThPo1.19</td>
<td>Deep Reinforcement Learning Based Tracking Control of van de Vusse Reactor</td>
<td>Ankalugari, Rahul Yadav; M U, Abuthahir; Magbool Jan, Nabil; Joseph, Ajin George</td>
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<tr>
<td>ThPo1.20</td>
<td>Temperature Estimation in Lithium-Ion Batteries through Cascaded Electrochemical-Thermal Models</td>
<td>Ferreira, Patryck; Tang, Shuxia</td>
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<tr>
<td>ThPo1.21</td>
<td>TUM CONTROL: Open Source Controller-Vehicle in Loop Simulation Framework for ultra-Rapid prototyping in Python</td>
<td>Zarrouki, Baha; Betz, Johannes</td>
</tr>
<tr>
<td>Number</td>
<td>Poster title</td>
<td>Authors</td>
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<td>ThPo1.22</td>
<td>Deep Reinforcement Learning Driven Adaptive Stochastic NMPC Reduces Conservatism, Enhances Feasibility and Improves Closed-Loop Performance</td>
<td>Zarrouki, Baha; Wang, Chenyang; Betz, Johannes</td>
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<tr>
<td>ThPo1.23</td>
<td>Safe Deep Reinforcement Learning (RL) Agent Adapts the Cost Function Weights of a Weights-Varying MPC (WMPC)</td>
<td>Zarrouki, Baha; Spanakakis, Marios; Betz, Johannes</td>
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<td>ThPo1.24</td>
<td>Noncontact Magnetic Manipulation Using Permanent Magnets</td>
<td>Ekanayake, Lahiru; Weerasekara Mudiyanselage, Janaka Madhusankha; Basnet, Dhiraj; Komae, Arash</td>
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<tr>
<td>ThPo1.25</td>
<td>Algebraic Prescribed-Time KKL Observer for Autonomous Nonlinear Systems</td>
<td>Marani, Yasmine; N'Doye, Ibrahima; Laleg-Kirati, Taous-Meriem</td>
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<td>ThPo1.26</td>
<td>Uncertainty Quantification in Physiological Modeling Using Bayesian Variational Autoencoders</td>
<td>Estiri, Elham; Mirinejad, Hossein</td>
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<tr>
<td>ThPo1.27</td>
<td>Reinforcement Learning and Nonlinear Integrated Controller for Guaranteed Local Stability</td>
<td>Nan, Shiqi; Chen, Chih-Chiang; Qian, Chunjiang</td>
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<tr>
<td>ThPo1.28</td>
<td>Benchmarking Surrogate Embedding Strategies for Model Predictive Control</td>
<td>Elorza Casas, Carlos Andres; Pulsipher, Joshua; Ricardez-Sandoval, Luis</td>
</tr>
<tr>
<td>ThPo1.29</td>
<td>Properties of Immersions for Systems with Multiple Limit Sets with Implications to Learning Koopman Embeddings</td>
<td>Liu, Zexiang; Ozay, Necmiye; Sontag, Eduardo</td>
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<tr>
<td>ThPo1.30</td>
<td>Particle Swarm Optimization for Training Quadrotor PID Controller</td>
<td>Rodriguez, Eric; Dong, Wenjie; Lu, Qi</td>
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<tr>
<td>ThPo1.31</td>
<td>On Control-Sync Technique for Multi-Task System Operation</td>
<td>Fateh, Fariba; Mirafzal, Behrooz</td>
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<tr>
<td>ThPo1.32</td>
<td>Staggered Steering of Wheeled-Legged Biped Robot</td>
<td>Montufar, Sergio; Qian, William</td>
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<td>ThPo1.33</td>
<td>Information-Based Anomaly Detection for Autonomous Agents</td>
<td>McKee, Sasha M; Haddadin, Osama; Leang, Kam K.</td>
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<tr>
<td>ThPo1.34</td>
<td>Estimating the Lateral Stability Region of the Vehicle Using the Koopman Spectrum</td>
<td>Kumar, Alok; Umathe, Bhagyashree; Vaidya, Umesh; Kelkar, Atul</td>
</tr>
<tr>
<td>ThPo1.35</td>
<td>Self Organized Neural Network for Swarm Robots</td>
<td>Han, Zhifeng; Walton, Claire</td>
</tr>
<tr>
<td>ThPo1.36</td>
<td>Deep Neural Network In-Proximity Effect Detection and Collision Avoidance for Aerial Vehicles</td>
<td>M Anderson, Jacob; Leang, Kam K.</td>
</tr>
<tr>
<td>ThPo1.37</td>
<td>Distribution-Matching Deployment: A Stein Variational Gradient Approach to Optimal Multisensor Placement</td>
<td>Ghimire, Donipolo; Kia, Solmaz S.</td>
</tr>
<tr>
<td>ThPo1.38</td>
<td>Real Application of Deep Reinforcement Learning for multi-agent Cooperation in Distributed Model-Based Predictive Control.</td>
<td>Aponte Rengifo, Oscar Emilio; Francisco, Mario; Vega Cruz, Pastora</td>
</tr>
<tr>
<td>ThPo1.39</td>
<td>Improving Drone Control: Achieving Strong Stability and Adaptability Using Online Reinforcement Learning</td>
<td>Avila, Ethan; Jaber, Halah; Frye, Michael</td>
</tr>
<tr>
<td>ThPo1.40</td>
<td>Parameter Design of P-PI Controller for Motion Control Systems Using Limited Pole Placement Method</td>
<td>Urakawa, Yoshiyuki; Ngamlamai, Sirichai</td>
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<tr>
<td>ThPo1.41</td>
<td>Cyber-Attack Detection by Using a Discrete-Time Model-Based Unknown Input Observer</td>
<td>Nguyen, Quang Huy; Sadki, Osama; Rafaralahy, Hugues; Haddad, Madjid; Zemouche, Ali</td>
</tr>
<tr>
<td>ThPo1.42</td>
<td>Closed-Loop Battery Manufacturing Process Control via End-of-Line Formation Features</td>
<td>Weng, Andrew; Less, Greg; Siegel, Jason B.; Stefanopoulou, Anna G.</td>
</tr>
<tr>
<td>ThPo1.43</td>
<td>Integrating Dynamic Risk Assessment with Model Predictive Control for Enhanced Safety and Operational Efficiency</td>
<td>Akundi, Sahithi Srijana; Liu, Yuanxing; Braniff, Austin; Dantas, Beatriz; Niknezhad, Shayan Sean; Tian, Yuhe; Khan, Faisal; Pistikopoulos, Efstratios N.</td>
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DAILY OVERVIEW OF EVENTS/ACTIVITIES

MONDAY OVERVIEW

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<th>Time</th>
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<td>Afternoon</td>
<td>Workshop 13. Please see the Workshops section for more information on the Monday workshops.</td>
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TUESDAY OVERVIEW

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<thead>
<tr>
<th>Time</th>
<th>Key Events</th>
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<tbody>
<tr>
<td>8:30 – 17:30</td>
<td>Workshops 1-3, 5-11, and AACC Bystander Training Workshop. Please see the Workshops section for more information on the Tuesday full-day workshops.</td>
</tr>
<tr>
<td>Afternoon</td>
<td>Workshop 4 and 12. Please see the Workshops section for more information on the Tuesday half-day workshops.</td>
</tr>
<tr>
<td>18:30 – 20:30</td>
<td>Opening Reception, Harbour Ballroom</td>
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WEDNESDAY OVERVIEW

<table>
<thead>
<tr>
<th>Time</th>
<th>Key Events</th>
</tr>
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<tbody>
<tr>
<td>07:30 – 08:30</td>
<td>Special Session: Early Career Welcome Breakfast (Pier 2)</td>
</tr>
<tr>
<td>08:15 – 08:30</td>
<td>2024 ACC Opening Remarks (Metro E/C)</td>
</tr>
<tr>
<td>08:30 – 09:30</td>
<td>Plenary Session (see Plenary Sessions, Metro E/C) “Control of Uncrewed Vehicle Systems – from Unconventional Flyers to Maritime Autonomy”, Kingsley Fregene, Lockheed Martin, USA</td>
</tr>
<tr>
<td>09:30 – 10:00</td>
<td>Coffee Break (Dockside Foyer, Pier/ Harbour Foyer, and Frontenac Area)</td>
</tr>
<tr>
<td>10:00 – 11:45</td>
<td>Morning Rapid Interactive (RI) Technical Sessions</td>
</tr>
<tr>
<td>10:00 – 11:30</td>
<td>Special Session: Family-friendly session – STEM-themed animated shorts and games (Dockside 1)</td>
</tr>
<tr>
<td>11:00 – 13:30</td>
<td>Special Sessions (see Special Sessions and Student Programs)</td>
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<td>● National Science Foundation: An Overview of NSF Programs (11:00 am – 12:30 pm, Pier 2)</td>
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<td></td>
<td>● Elsevier: How to get published- first steps in getting your work published in journals (11:30 – 12:30, Queens Quay 1)</td>
</tr>
</tbody>
</table>
**Daily Overview**

- Tracking Control Problems with Open-Source Software in Julia and Python (11:30 – 13:00, Bay)
- Social Justice and Control Theory -- Bridging engineering and equity (11:30 – 12:30, Dockside 2)
- IEEE CSS Women in Control Luncheon (12:00 – 13:30, Pier 4 and 5)

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<thead>
<tr>
<th>Time</th>
<th>Key Events</th>
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<tbody>
<tr>
<td>13:30 – 15:00</td>
<td>Mid-Day Technical Sessions</td>
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<tr>
<td>15:00 – 15:30</td>
<td>Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)</td>
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<tr>
<td>15:30 – 17:00</td>
<td>Late Afternoon Technical Sessions</td>
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<tr>
<td>15:30 – 17:00</td>
<td>Student Best Paper Award Session (Pier 9) – Please see Student Programs section for details</td>
</tr>
<tr>
<td>17:30 – 19:30</td>
<td>Special Session: Student networking event at ACC 2024 (17:30 – 19:30, Metro W)</td>
</tr>
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**THURSDAY OVERVIEW**

<table>
<thead>
<tr>
<th>Time</th>
<th>Key Events</th>
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<tbody>
<tr>
<td>07:30 – 08:30</td>
<td>Special Session: Student Breakfast (Part I) – Security and Privacy of the Next-Generation Cyber-Physical Systems (Dockside 1)</td>
</tr>
<tr>
<td>08:30 – 09:30</td>
<td>Plenary Session (see <em>Plenary Sessions</em>, Metro E/C)</td>
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<tr>
<td></td>
<td>“A Control Systems Approach to Cell Fate Reprogramming”, Domitilla Del Vecchio, Massachusetts Institute of Technology, USA.</td>
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<tr>
<td>09:30 – 10:00</td>
<td>Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)</td>
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<tr>
<td>10:00 – 11:00</td>
<td>Eckman Plenary Lecture (see <em>Plenary Sessions</em>, Metro E/C)</td>
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<tr>
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<td>“Hybrid Dynamical Seeking Systems: Model-Free Feedback Decision-Making and Control”, Jorge I. Poveda, University of California, San Diego, USA</td>
</tr>
<tr>
<td>11:00 – 11:45</td>
<td>Late-breaking News Poster Session (Metro, Harbour, and Frontenac Ballrooms)</td>
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<tr>
<td>11:45 – 12:45</td>
<td>Awards Ceremony (Frontenac Ballroom)</td>
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<td>Time</td>
<td>Events</td>
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<tr>
<td>11:30 – 13:15</td>
<td>Special Sessions (see <em>Special Sessions and Student Programs</em>)</td>
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<td></td>
<td>● Industry Lunch: MERL: Fundamental Research with Real-World Impact (12:00 – 13:15, Pier 2)</td>
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<td>● Fostering JEDI in the Controls Community (11:30 – 12:30, Queens Quay 1)</td>
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<td>● Industry session session: The Boeing Company (12:00 – 13:15, Queens Quay 2)</td>
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<td>● Getting funded by NSF: Proposal preparation and the merit review process (11:30 – 13:15, Bay)</td>
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<td>● How to make a STEM outreach film (11:30 – 12:30, Dockside 1)</td>
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<tr>
<td>13:30 – 15:00</td>
<td>Mid-Day Technical Sessions</td>
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<tr>
<td>15:00 – 15:30</td>
<td>Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)</td>
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<tr>
<td>15:30 – 17:00</td>
<td>Late Afternoon Technical Sessions</td>
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<tr>
<td>18:30 – 21:30</td>
<td>Conference banquet at the Royal Ontario Museum</td>
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## FRIDAY OVERVIEW

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<th>Time</th>
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<tr>
<td>07:30 – 08:30</td>
<td>Special Session: Student Breakfast (Part II) – Security and Privacy of the Next-Generation Cyber-Physical Systems (Dockside 1)</td>
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<tr>
<td>08:30 – 09:30</td>
<td>Plenary Session (see Plenary Sessions, Metro E/C) “Automatic Control in the Era of Artificial Intelligence” Francesco Borrelli, University of California, Berkeley, USA</td>
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<tr>
<td>09:30 – 10:00</td>
<td>Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)</td>
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<tr>
<td>10:00 – 11:45</td>
<td>Morning Rapid Interactive (RI) Technical Sessions</td>
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<tr>
<td>10:00 – 13:15</td>
<td>Special Sessions (see Special Sessions)</td>
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<td>● Feedback screening of &quot;Independence&quot; (10:15 – 13:15, Dockside 1)</td>
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<td>● Mathworks Lunch: Asynchronous Engineering Instruction and Increased Teaching Impact (12:00 – 13:15, Pier 2)</td>
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<td>● Role of control on climate resilience (11:30 – 13:00, Queens Quay 1)</td>
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<td>● Recent systems and control research in Canada (11:30 – 13:00, Queens Quay 2)</td>
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<td>● Navigating the Landscape of Innovation: Insights from Industry and Consulting (11:30 – 12:30, Bay)</td>
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<tr>
<td>13:30 – 15:00</td>
<td>Mid-Day Technical Sessions</td>
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<tr>
<td>15:00 – 15:30</td>
<td>Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)</td>
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<tr>
<td>15:30 – 17:00</td>
<td>Late Afternoon Technical Sessions</td>
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<tr>
<td>18:30 – 20:30</td>
<td>Closing Reception (Harbour Ballroom area)</td>
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2024 American Control Conference

TECHNICAL PROGRAM

Program at a Glance
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<tr>
<td>10:00-11:03</td>
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<td>Metro E/C</td>
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<td>Dockside 3</td>
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<td>Yonge</td>
<td>Pier 3</td>
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<td>Control and Operations</td>
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<td>Linear Systems</td>
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<td>11:00-12:00</td>
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## ACC 2024 Technical Program Thursday July 11, 2024

### 10:00-11:00 TH1
**Eckman Plenary Lecture**

- Hybrid Dynamical Seeking Systems: Model-Free Feedback Decision-Making and Control

### 11:00-11:45 THPr1
**Late Breaking Poster Session**

- Metro, Harbour, Frontenac Ballrooms

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### 15:30-17:00 TH201
**Metro E/C Agents-Based Systems I**

- 15:30-17:00 Metro E/C Agents-Based Systems II

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### 17:00-19:00 TH202
**Metro E/C Agents-Based Systems III**

- 17:00-19:00 Metro E/C Agents-Based Systems IV

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### 19:00-21:00 TH203
**Metro E/C Agents-Based Systems V**

- 19:00-21:00 Metro E/C Agents-Based Systems VI

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### 21:00-23:00 TH204
**Metro E/C Agents-Based Systems VII**

- 21:00-23:00 Metro E/C Agents-Based Systems VIII
2024 American Control Conference

TECHNICAL PROGRAM

Detailed Program Listing
Technical Program for Wednesday July 10, 2024

WeP1 Metro E/C
Control of Uncrewed Vehicle Systems – from Unconventional Flyers to Maritime Autonomy (Plenary Session)

Chair: Grover, Martha
Georgia Institute of Technology
Co-Chair: Leang, Kam K.
University of Utah

08:30-09:30 WeP1.1
Fregene, Kingsley C.

WeA01 Metro E/C
RI: Machine Learning in Control (RI Session)

Chair: Shahbakhti, Mahdi
University of Alberta
Co-Chair: Yoon, Se Young (Pablo)
University of New Hampshire

10:00-10:03 WeA01.1
Bagheri, Amirsalar; Patrignani, Andres; Ghanbarian, Behzad; Babaei Pourkargar, Davood

10:03-10:06 WeA01.2
Transfer Learning for Dynamical Systems Models Via Autoencoders and GANs, pp. 8-14.
Damiani, Angelo; Viera López, Gustavo; Manganini, Giorgio; Metelli, Alberto; Maria; Restelli, Marcello

10:06-10:09 WeA01.3
Concurrent Learning and Lyapunov-Based Updates of Deep Neural Networks for Euler-Lagrange Dynamic Systems, pp. 15-20.
Basyal, Sujata; Ting, Jonathan; Mishra, Kislaya; Allen, Brendon C.

10:09-10:12 WeA01.4
Model Free Difference Feedback Control of
Zaheer, Muhammad Hamad; Yoon, Se Young (Pablo)

10:12-10:15 WeA01.5
Control-Based Graph Embeddings with Data Augmentation for Contrastive Learning, pp. 27-32.
Ahmad, Obaid Ullah; Said, Anwar; Shabbir, Mudassir; Koutsoukos, Xenofon; Abbas, Waseem

10:15-10:18 WeA01.6
Distributed Reinforcement Learning for Swarm Systems with Reward Machines, pp. 33-38.
Meshkat Alsadat, Shayan; Baharisinghari, Nasim; Paliwal, Yash; Xu, Zhe

10:18-10:21 WeA01.7
Integrating Machine Learning in Process Control with LSTMc: A Case Study in Batch Crystallization, pp. 39-44.
Sitapure, Niranjan; Kwon, Joseph

10:21-10:24 WeA01.8
Learning-Based Model Predictive Control of an Ammonia Synthesis Reactor, pp. 45-50.
Oliveira Cabral, Thiago; Bagheri, Amirsalar; Babaei Pourkargar, Davood

10:24-10:27 WeA01.9
Explainable Optimal Solutions Using Fuzzy Inference, pp. 51-55.
Deneke, Tewodros Lemma; Dunia, Ricardo; Baldea, Michael

10:27-10:30 WeA01.10
Solving Two-Player General-Sum Game between Swarms, pp. 56-61.
Ghimire, Mukesh; Zhang, Lei; Zhang, Wenlong; Ren, Yi; Xu, Zhe

10:30-10:33 WeA01.11
Sitapure, Niranjan; Kwon, Joseph

10:33-10:36 WeA01.12

Min-Max Optimization under Delays, pp. 80-85.


An Effective Hyperparameter Tuning Method for Ising Machines in Practical Use, pp. 98-103.

Data-Efficient Uncertainty-Guided Model-Based Reinforcement Learning with Unscented Kalman Bayesian Neural Networks, pp. 104-110.

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Co-Chair: Nazari, Junfeng  Arizona State University
Organizer: Zhao, Ruxiu  University of Arizona
Organizer: Askari, Iman  UC Davis
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Co-Chair: Wang, Zhenyu  Dow Chemical
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13:45-14:00  Web13.2
Minimum-Time Planar Paths with up to Two Constant Acceleration Inputs and $L_2$ Velocity and Acceleration Constraints, pp. 925-930.
Montano, Victor; Zhao, Haoran; Abdurahiman, Nihal; Navkar, Nikhil
Vishwas; Becker, Aaron

14:00-14:15  Web13.3
Data-Driven Synthesis of Configuration-Constrained Robust Invariant Sets for Linear Parameter-Varying Systems, pp. 931-936.
Mejari, Manas; Mulagaleti, Sampath; Kumar; Bemporad, Alberto

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Safety Index Synthesis with State-Dependent Control Space, pp. 937-942.
Chen, Rui; Zhao, Weiye; Liu, Changliu

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Danielson, Claus; Brandt, Theo

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Web14  Wellington
Modeling, Control and Estimation of Soft Material and Continuum Systems (Invited Session)
Chair: Vikas, Vishesh
University of Alabama
Co-Chair: Chen, Zheng
University of Houston
Organizer: Vikas, Vishesh
University of Alabama
Organizer: Gilbert, Hunter B.
Louisiana State University
Organizer: Zhao, Jianguo
Colorado State University
Organizer: Tan, Xiaobo
Michigan State University

13:30-13:45  Web14.1
Physics-Informed Online Estimation of Stiffness and Shape of Soft Robotic Manipulators (I), pp. 957-962.
Fairchild, Preston; Mei, Yu; Tan, Xiaobo

13:45-14:00  Web14.2
Haghshenas-Jaryani, Mahdi

14:00-14:15  Web14.3
Kaaya, Theophilus; Koc, Denizcan; Zhu, Qiang; Chen, Zheng

14:15-14:30  Web14.4
Modeling and Inverse Compensation of the Non-Smooth Coiling-Induced Actuation in Twisted and Coiled String Actuators, pp. 975-980.
Konda, Revanth; Zhang, Jun

14:30-14:45  Web14.5
Efficient Learning and Control of String-Type Artificial Muscle Driven Robotic Systems, pp. 981-987.
Tao, Jiyue; Rajendran, Sunil Kumar; Zhang, Yunsong; Zhao, Feitian; Zhao, Dexin; Shen, Tongsheng

Web15  Yonge
Estimation and Control of Distributed Parameter Systems I (Invited Session)
Chair: Demetriou, Michael A.
Worcester Polytechnic Institute
Co-Chair: Hu, Weiwei
University of Georgia
Organizer: Demetriou, Michael A.
Worcester Polytechnic Institute
Organizer: Hu, Weiwei
University of Georgia

13:30-13:45  Web15.1
Limit Cycle Generation in Van Der Pol Flavored PDE Setting (I), pp. 988-993.
Aguilar, Luis T.; Orlov, Yuri

13:45-14:00  Web15.2
Rates of Convergence in a Class of Native
Spaces for Reinforcement Learning and Control (I), pp. 994-999.
Bouland, Ali; Niu, Shengyuan; Paruchuri, Sai Tej; Kurdila, Andrew J.; Burns, John A; Schuster, Eugenio

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Distributed Dynamic Encirclement Control for First-Order Multi-Agent Systems with Communication Delay (I), pp. 1000-1005.
Hasanzadeh, Milad; Tang, Shuxia

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Predictor-Based Prescribed-Time Output Feedback for a Parabolic PDE (I), pp. 1006-1011.
Zekraoui, Salim; Espitia, Nicolas; Perruquet, Wilfrid; Krstic, Miroslav

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Practical Observers for Velocity Field Estimation of Normal Flow Equations (I), pp. 1012-1017.
Alessandri, Angelo; Bagnerini, Patrizia; Gaggero, Mauro; Mantelli, Luca

14:45-15:00 WeB15.6
Distributed Flocking Control with Ellipsoidal Level Sets, pp. 1018-1023.
Hastedt, Philipp; Datar, Adwait; Kocev, Kliment; Werner, Herbert

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Wind Turbines and Wind Farms (Invited Session)
Chair: Sinner, Michael
Co-Chair: Mulders, Sebastiaan Paul
Organizer: Mulders, Sebastiaan Paul
Organizer: Sinner, Michael
Organizer: Bay, Christopher
Organizer: Fleming, Paul
Organizer: van Wingerden, Jan-Willem
National Renewable Energy Laboratory
Delft University of Technology
National Renewable Energy Laboratory
National Renewable Energy Laboratory
Delft University of Technology

13:30-13:45 WeB16.1

WeB16 Dockside 4
Short-Term Wind Forecasting Using Surface Pressure Measurements (I), pp. 1024-1029.
Abootorabi, Seyedalireza; Leonard, Stefano; Rotea, Mario; Zare, Armin

13:45-14:00 WeB16.2
Analysis of Extremum Seeking Control for Wind Turbine Torque Controller Optimization by Aerodynamic and Generator Power Objectives (I), pp. 1030-1037.
Mulders, Sebastiaan Paul; Gallo, Alexander J.; Rotea, Mario

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Putri, Saskia; Hosseinipour, Ali; Ge, Xiaoyu; Moazeni, Farrah; Khazaei, Javad

14:15-14:30 WeB16.4
Reinforcement Learning Control for Enhancing Marine Hydrokinetic Turbine Energy Generation (I), pp. 1044-1050.
Barton, Samuel; Brekken, Ted; Cao, Yue

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H Infinity Phase Locking Control for Wave Induced Wake Mixing (I), pp. 1051-1056.
v d den Berg, Daniel; De Tavernier, Delphine; van Wingerden, Jan-Willem

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Self-Learning Data-Driven Wind Farm Control Strategy Using Field Measurements (I), pp. 1057-1064.
Hulsman, Paul; Howland, Michael; Göcmen, Tuhfe; Petrović, Vlaho; Kühr, Martin

WeB17 Dockside 5
Cooperative Control (Regular Session)
Chair: Chen, Lijun
Co-Chair: Liu, Junwei
National Renewable Energy Laboratory
Southern University of Science and Technology

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Su, Ruchao; Li, Xianwei; Li, Shaoyuan
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<td>Lin, Chi-Hui; Koh, Joewie J.; Roncone, Alessandro; Chen, Lijun</td>
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Park, Hyuk; Zhou, Duo; Hanasusanto, Grani A.; Tanaka, Takashi

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Safe Tracking Control of Discrete-Time Nonlinear Systems Using Backward Reachable Sets, pp. 1172-1179.

Serry, Mohamed; Yang, Liren; Ozay, Necmiye; Liu, Jun

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Kalman Filtering (Regular Session)

Chair: Molloy, Timothy L. Australian National University
Co-Chair: Chen, Tongwen University of Alberta

13:30-13:45

Data-Driven Stealthy Attacks on Remote State Estimation with Sliding-Window Anomaly Detectors, pp. 1180-1185.

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Crouse, Steven; Prasad, Rupanjali; Rousseau, Ronald; Grover, Martha

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Zhao, Tian; Molloy, Timothy L.

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Linear Systems (Regular Session)

Chair: Drummond, Ross University of Sheffield
Co-Chair: Jokic, Andrej University of Zagreb

13:30-13:45


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Machine Learning II (Regular Session)
Chair: Xu, Zeyuan  National University of Singapore
Co-Chair: Jin, Ming  Virginia Tech
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16:00-16:15  WeC01.3
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Hassanpour, Hesam; Mhaskar, Prashant; Corbett, Brandon
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WeC02  Harbour
Network Control Systems II (Regular Session)
Chair: Rojas, Alejandro J.  Universidad De Concepción
Co-Chair: Davoodi, Mohammadreza  University of Georgia
15:30-15:45  WeC02.1
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WeC03  Frontenac
Autonomous Robots II (Regular Session)
Chair: Seo, Joohwan  University of California, Berkeley
Co-Chair: Coogan, Samuel  Georgia Institute of Technology
15:30-15:45  WeC03.1
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Cho, Minhyun; Hwang, Soung-hwan; Hwang, Inseok
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Nino, Cristian F.; Patil, Omkar Sudhir; Dixon, Warren E.
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WeC05.6 16:45-17:00  WeC05.5

**Optimal Loop Shaping and Disturbance Rejection Beyond the Nyquist Frequency Using a Forward Model Disturbance Observer and Convex Optimization Based Filter Design**, pp. 1417-1422.
Chu, Thomas; Hu, Xiaohai; Chen, Xu

WeC06  Queens Quay 1

**Modeling and State Estimation for Batteries (Invited Session)**

Chair: Song, Ziyou  University of Michigan, Ann Arbor
Co-Chair: De Castro, Ricardo  University of California, Merced
Organizer: Zhang, Dong  University of Oklahoma
Organizer: Soudbaksh, Damoon  Temple University
Organizer: Jain, Neera  Purdue University
Organizer: Dey, Satadru  The Pennsylvania State University
Organizer: Tang, Shuxia  Texas Tech University
Organizer: Roy, Tanushree  Texas Tech University
Organizer: Moura, Scott  University of California, Berkeley
Organizer: Lin, Xinfan  University of California, Davis
Organizer: De Castro, Ricardo  University of California, Merced
Organizer: Song, Ziyu  University of Michigan, Ann Arbor
Organizer: Fogelquist, Jackson  University of California, Davis

15:30-16:15  WeC06.1  **Bias-Compensated State Estimation Algorithm for LFP Batteries with Flat OCV-SOC Curves (I)**, pp. 1423-1428.

16:15-16:30  WeC06.2  Yi, Baozhao; Zhang, Jiawei; Song, Ziyu

**Nonlinear Fractional Dynamics Integrated Physics-Informed Neural Network Model for LiFePO4 Batteries in Electric Vehicles (I)**, pp. 1429-1434.
Borah, Manashita; Jiang, Shida; Shi, Junzhe; Moura, Scott

16:00-16:15  WeC06.3  **Lightweight Electrochemical Hybrid Modeling Approach for Li-Ion Batteries Using Gaussian Process Regression (I)**, pp. 1435-1440.
Fogelquist, Jackson; Lin, Xinfan

16:15-16:30  WeC06.4  **Weaknesses and Improvements of the Extended Kalman Filter for Battery State-Of-Charge and State-Of-Health Estimation (I)**, pp. 1441-1448.
Jiang, Shida; Shi, Junzhe; Borah, Manashita; Moura, Scott

16:30-16:45  WeC06.5  **Interconnected Sigma-Point Kalman Filter Application for Electrochemical State Estimation of Lithium-Ion Batteries**, pp. 1449-1454.
Kawakita de Souza, Aloisio Henrique; Plett, Gregory L.; Trimboli, Michael

WeC07  Queens Quay 2

**Traffic Control I (Regular Session)**

Chair: Malioukopoulos, Andreas A.  Cornell University
Co-Chair: Timotheou, Stelios  University of Cyprus

15:30-15:45  WeC07.1  **Safe Optimal Interactions between Automated and Human-Driven Vehicles in Mixed Traffic with Event-Triggered Control Barrier Functions**, pp. 1455-1460.
Li, Anni; Cassandras, Christos G.; Xiao, Wei

15:45-16:00  WeC07.2  **Parameter Estimation in Optimal Tolling for Traffic Networks under the Markovian Traffic Equilibrium**, pp. 1461-1467.
Chiu, Chih-Yuan; Sastry, Shankar
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Co-Chair: Demetriou, Michael A.

Organizer: Hu, University of Georgia

**WeC16**

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Co-Chair: Caiazzo, Bianca

Chair: Barooah, Prabir

Indian Institute of Technology, Guwahati

University of Naples Federico II
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Co-Chair: Jensen, Emily University of California, Berkeley
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Chair: Gil, Stephanie
Co-Chair: Akgun, Orhan Eren
Organizer: Akgun, Orhan Eren
Organizer: Nedich, Angelia
Organizer: Gil, Stephanie
Organizer: Dayi, Arif Kerem

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13:45-14:00 ThB02.2
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Chair: Shan, Jinjun
Co-Chair: Al Janaideh, Mohammad
Organizer: Al Janaideh, Mohammad
Organizer: ENIT Tarbes, INPT, Rakotondrabe, Micky

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Chair: Melo, Diego
Co-Chair: Moon, Jinwook
Organizer: Melo, Diego
Organizer: Moon, Jinwook

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Frontenac
Mechatronics II (Invited Session)
Chair: Miao, Song
Co-Chair: Sun, Jie
Organizer: Miao, Song
Organizer: Sun, Jie

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14:30-14:45 ThB03.5
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Chair: Lahijanian, University of Colorado Boulder
Co-Chair: Hinson, The Boeing Company Kimber

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Skovbekk, John; Laurenti, Luca; Frew, Eric W.; Lahijanian, Morteza

13:45-14:00 ThB04.2
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Chair: Yousefian, Rutgers University Farzad
Co-Chair: Dai, Ran Purdue University

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14:45-15:00 ThB05.6
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Chair: Zhang, Dong
University of Oklahoma
Co-Chair: Fogelquist, Jackson
University of California, Davis
Organizer: Zhiyou, Michigan, Ann Arbor
Michigan, University of
Fogelquist, Jackson
California, Davis

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14:15-14:30 ThB06.4
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Lipka, Johannes Bernd; Hans, Christian Andreas

14:30-14:45 ThB06.5
Ghosh, Sanchita; Roy, Tanushree

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Chen, Yunzhi; Hill, Daniel; Billings, Blake; Hedengren, John; Powell, Kody

ThB07 Queens Quay 2
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Chair: Vehlhaber, Finn Niklas
Eindhoven University Technology
Co-Chair: Malikopoulos, Andreas A.
Cornell University
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Chair: Westwick, David
Schulich School of Engineering, University of Calgary
Co-Chair: Kamalapurkar, Rushikesh
Oklahoma State University

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Chair: Muradore, Riccardo
University of Verona
Co-Chair: Paternain, Santiago
Rensselaer Polytechnic Institute

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Cheng, Shiyu; Clark, Andrew

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(Regular Session)

Chair: Liu, Jinfeng  
University of Alberta

Co-Chair: Yong, Sze Zheng  
Northeastern University

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Pati, Tarun; Hwang, Seunghoon; Yong, Sze Zheng

13:45-14:00  ThB12.2

*Distributed Source Seeking for a Periodic Signal Using an Improved Gaussian Process-Based Model Predictive Control*, pp. 2420-2425.

Gao, Xinzhou; Shu, Zhan

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*Homothetic Tube Model Predictive Control with Multi-Step Predictors*, pp. 2426-2431.

Saccani, Danilo; Ferrari-Trecate, Giancarlo; Zeilinger, Melanie N.; Köhler, Johannes

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Gracia, Victor; Krupa, Pablo; Alamo, Teodoro; Limon, Daniel

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**ThB13**

**Richmond**

**Constrained Control III (Regular Session)**

Chair: Namerikawa, Toru  
Keio University

Co-Chair: Bakolas, Efstathios  
The University of Texas at Austin

13:30-13:45  ThB13.1

*A Performance-Based Model Recovery Anti-Windup Design for Linear Systems Subject to Actuator Saturation*, pp. 2452-2457.

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*Disturbance Observer-Based Robust Integral Control Barrier Functions for Nonlinear Systems with High Relative Degree*, pp. 2470-2475.

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Singh, Shubham; Jain, Anoop

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**ThB14**

**Wellington**

**Set-Based Methods in Dynamic Systems and Control (Invited Session)**

Chair: Coogan, Samuel  
Georgia Institute of Technology

Co-Chair: Pangborn, Herschel  
The Pennsylvania State University

Organizer: Koeln, University of Texas at Austin

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Gracia, Victor; Krupa, Pablo; Alamo, Teodoro; Limon, Daniel
Justin Dallas Organizer: Pangborn, Herschel The Pennsylvania State University Organizer: Jain, Neera Purdue University Organizer: Ruths, Justin University of Texas at Dallas Organizer: Bird, Trevor J. PC Krause and Associates Organizer: Siefert, Jacob Pennsylvania State University

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ThB15 Yonge Estimation and Control of Distributed Parameter Systems III (Invited Session)
Chair: Hu, Weiwei University of Georgia
Co-Chair: Demetriou, Michael A. Worcester Polytechnic Institute
Organizer: Hu, Weiwei University of Georgia

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Corbin, Nicholas; Kramer, Boris

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Hu, Weiwei; Demetriou, Michael A.

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ThB16 Dockside 4 Control Co-Design for Energy Systems (Invited Session)
Chair: Russell, Kayla University of Illinois at Urbana-Champaign
Co-Chair: Sharma, Himanshu Pacific Northwest National Laboratory
Organizer: Vermillion, Christopher University of Michigan
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**Distributed Control II (Regular Session)**

Chair: Cichella, Venanzio

Co-Chair: Jensen, Emily

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**Stability of Nonlinear Systems II (Regular Session)**

Chair: Lee, Donghwan

Co-Chair: Chen, Chih-Chiang

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**ThB21**

**Reduced-Order Modeling and Numerical Algorithms** (Regular Session)

Chair: Goel, Ankit  
University of Maryland Baltimore County

Co-Chair: Portella Delgado, Jhon Manuel  
University of Maryland Baltimore County

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**ThC01**

**Agents-Based Systems II** (Regular Session)

Chair: Cenedese, Angelo  
University of Padova

Co-Chair: Simaan, Marwan A.  
University of Central Florida

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**ThC02**

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Chair: Gil, Stephanie  
Harvard University

Co-Chair: Akgun, Orhan Eren  
Harvard University

Organizer: Akgun, Orhan Eren  
Harvard University

Organizer: Nedich, Angelia  
Arizona State University

Organizer: Gil, Stephanie  
Harvard University

Organizer: Dayi, Arif Kerem  
Harvard University

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Riess, Hans; Henselman-Petrusek, Gregory; Munger, Michael; Ghrist, Robert; Bell, Zachary; Zavlanos, Michael M.

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Chair: Sira-Ramirez, Hebertt
Co-Chair: Norman, Kevin, Texas Tech University

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ThC07  Queens Quay 2

Control Solutions for Enhancing the Efficiency and Adoption of Electric Vehicles (Invited Session)

Chair: Nazari, Shima
Co-Chair: Kwak, Kyung Hyun
Organizer: Rajakumar Deshpande, Shreshtta
Organizer: Kim, Youngki
Organizer: Gupta, Shobhit
Organizer: Nazari, Shima
UC Davis
University of Michigan - Dearborn
Southwest Research Institute
University of Michigan - Dearborn
General Motors
UC Davis

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Bertucci, Juan Pablo; Hofman, Theo; Salazar, Mauro

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Chair: Koch, Charles Robert
Co-Chair: Singh, Ravendra

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Gajjar, Aatam; El-Farra, Nael H.

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Chair: Phillips, Sean
Air Force Research Laboratory
Co-Chair: Soderlund, Alexander
The Ohio State University
Organizer: Petersen, Chris
University of Florida
Organizer: Soderlund, Alexander
The Ohio State University
Organizer: Phillips, Sean
Air Force Research Laboratory

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Chair: L'Afflitto, Andrea
Virginia Tech
Co-Chair: Garcia, Rodolfo
New Mexico State University

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**ThC13** Richmond

**Advanced Methods in Control (Regular Session)**

Chair: Kawano, Yu Hiroshima University
Co-Chair: Broucke, Mireille E. Univ. of Toronto

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**ThC14** Wellington

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Chair: Chapman, Margaret P University of Toronto
Co-Chair: Motee, Nader Lehigh University
Organizer: Liu, Guangyi Lehigh University
Organizer: Chapman, Margaret P University of Toronto
Organizer: Mohajerin Esfahani, Peyman TU Delft
Organizer: Motee, Nader Lehigh University

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ThC15 Yonge
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   Chair: Hu, Weiwei University of Georgia
   Co-Chair: Demetriou, Michael A. Worcester Polytechnic Institute
   Organizer: Hu, Weiwei University of Georgia

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   Chair: Zuo, Lei University of Michigan
   Co-Chair: Ringwood, John V. Maynooth University, Ireland
   Organizer: Hasankhani, Arezoo Cornell University
   Organizer: Tang, Yufei Florida Atlantic University
   Organizer: Li, Perry Y. Univ. of Minnesota
   Organizer: Zuo, Lei Univeristy of Michigan
   Organizer: Demetriou, Michael A. Worcester Polytechnic Institute

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**ThC17** Dockside 5  
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<td>Wu, Wuwei; Zhang, Shiqi; Li, Zhongkui; Chen, Jie; Georgiou, Tryphon T.</td>
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<td>Wang, Zili; Andersson, Sean B.; Tron, Roberto</td>
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16:30-16:45 ThC19.5
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16:45-17:00 ThC19.6
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Chair: Ozer, Ahmet Ozkan
Co-Chair: Hamel, I3S-CNRS-UCA Tarek

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Ozer, Ahmet Ozkan; Rasaq, Uthman; Khalilullah, Sk Md Ibrahim

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State Omnicience of Linear Time-Invariant Distributed Estimators, pp. 3454-3459.
Hays, Christopher; Phillips, Sean; Henderson, Troy

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State Estimation for Linear Systems with Quadratic Outputs, pp. 3467-3472.
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16:30-16:45 ThC20.5
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Glushchenko, Anton; Lastochkin, Konstantin

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Chair: Soudbakhsh, Damoon
Co-Chair: Lin, Xinfan
Organizer: Zhang, Dong
Organizer: Soudabakhsh, Damoon
Organizer: Jain, Neera
Organizer: Dey, Satadru
Organizer: Tang, Shuxia
Organizer: Roy, Tanushree
Organizer: Moura, Scott
Organizer: Lin, Xinfan

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University of California, Davis
University of Oklahoma
Temple University
Purdue University
The Pennsylvania State University
Texas Tech University
Texas Tech University
University of California, Berkeley
University of California, Davis

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<td>Ebrahimi, Iman; De Castro, Ricardo; Tran, Vivian; Stefanopoulou, Anna G.; Feng, Shuang</td>
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Technical Program for Friday July 12, 2024

FrP1

Automatic Control in the Era of Artificial Intelligence (Plenary Session)

Chair: Leang, Kam K.
Co-Chair: Grover, Martha
University of Utah
Georgia Institute of Technology

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Borrelli, Francesco

FrA01
Learning and Optimization (RI Session)

Chair: Chhabra, Robin
Co-Chair: Yi, Jingang
Carleton University
Rutgers University

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10:03-10:06 FrA01.2
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10:06-10:09 FrA01.3
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**FrA02** Harbour

**RI: Advances in Optimal Control (RI Session)**

| Chair: Andersson, Sean B. |
| Co-Chair: Yao, Bin |
| Boston University |
| Purdue University |

Vladu, Emil

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Safari, Amirsaeid; Hoagg, Jesse B.


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Chair: Labbadi, Moussa
Aix-Marseille University, LIS UMR CNRS 7020, Marseille, France
Co-Chair: Orosz, Gabor
University of Michigan

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ASME-IEEE Joint Invited Session on Healthcare and Medical Systems (Invited Session)

Chair: Allen, Brendon C.
Auburn University
Co-Chair: Frigge, Anna Franziska
Uppsala University
Organizer: Rose, Chad
Auburn University
Organizer: Allen, Brendon C.
Auburn University
Organizer: Zhang, Wenlong
Arizona State University
Organizer: Hahn, Jin-Oh
University of Maryland
Organizer: Medvedev, Alexander V.
Uppsala University

13:30-13:45 FrB14.1
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13:45-14:00 FrB14.2
Baskaran, Avinash; Basyal, Sujata; Allen, Brendon C.; Rose, Chad

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Estimation and Control of Distributed Parameter Systems V (Invited Session)
Chair: Demetriou, Michael A. Worcester Polytechnic Institute
Co-Chair: Hu, Weiwei University of Georgia
Organizer: Demetriou, Michael A. Worcester Polytechnic Institute
Organizer: Hu, Weiwei University of Georgia

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Li, Zhaqing; Guglielmi, Roberto

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Chair: Pangborn, Herschel The Pennsylvania State University
Co-Chair: Chakrabarty, Ankush Mitsubishi Electric Research Laboratories (MERL)
Organizer: Koeln, Justin University of Texas at Dallas
Organizer: Bird, Trevor, J. PC Krause and Associates
Organizer: Pangborn, Herschel The Pennsylvania State University
Organizer: Nash, Austin Kettering University
Organizer: Drgona, Jan Pacific Northwest National Laboratory
Organizer: Blizard, Audrey The Ohio State University

13:30-13:45 FrB16.1
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13:45-14:00 FrB16.2
Shaikh, Juned; Koeln, Justin

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Deshpande, Vedang M.; Chakrabarty, Ankush; P. Vinod, Abraham; Laughman, Christopher R.

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Silva, Luiz; Lizarralde, Fernando; Peixoto, Alessandro Jacoud

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Chair: Kim, Jin Sung
Co-Chair: Shen, Minghao

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Chair: Trivedi, University of Colorado
Co-Chair: Phillips, Air Force Research Laboratory

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Chair: Sforni, Lorenzo - Alma Mater Studiorum - Università Di Bologna
Co-Chair: Poveda, Jorge I. - University of California, San Diego

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Nassiri, Samir; Labadi, Moussa; Chatri, Chakib; Cherkaoui, Mohamed

FrC01
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Convergence Behavior and Applications in Iterative Learning Control (Invited Session)

Chair: Koscielniak, Shane
Co-Chair: Bristow, Douglas A.
Organizer: Koscielniak, Shane

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Co-Chair: Ghasemi, Masood Institute

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Co-Chair: Labbadi, Moussa Aix-Marseille University, LIS UMR CNRS 7020, Marseille, France

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Co-Chair: Seiler, Peter
University of Michigan, Ann Arbor
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Purdue University
Co-Chair: Saoud, Adnane
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**Co-Chair:** Kim, Jung Hoon  
Pohang University of Science and Technology

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University of Iowa

**Co-Chair:** Bianchin, Gianluca  
University of Louvain

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**Co-Chair:** Al-Janaidah, Mohammad  
University of Guelph

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Co-Chair: Stolpe, Phoebus Raphael

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2024 American Control Conference

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SOCIETY REVIEW CHAIRS

AIAA
Maruthi Akella
The University of Texas at Austin
makella@mail.utexas.edu

AIChE
Jesus Flores-Cerrillo
Linde
Jesus.Flores-Cerrillo@linde.com

ASME
Marcello Canova
The Ohio State University
canova.1@osu.edu

IEEE
Amir G. Aghdam
Concordia University
aghdam@ieee.org

INFORMS-APS
Mark S. Squillante
IBM Research
mss@us.ibm.com

ISA
Lili Dong
Cleveland State University
l.dong34@csuohio.edu

SCS
Xin Wang
Southern Illinois University, Edwardsville
xwang@siue.edu

SIAM
Jacquelien M.A. Scherpen
University of Groningen
j.m.a.scherpen@rug.nl
OPENING RECEPTION
Tuesday, July 9, 6:30 PM – 8:30 PM
Westin Harbour Castle, Harbour Ballroom

AWARDS CEREMONY
Thursday, July 11, 11:45 AM – 12:45 PM
Westin Harbour Castle, Frontenac Ballroom

CONFERENCE BANQUET
Thursday, July 11, 6:30 PM – 9:30 PM
Royal Ontario Museum

CLOSING RECEPTION
Friday, July 12, 6:30 – 8:30 PM
Westin Harbour Castle, Harbour Ballroom