ACC 2024
CONFERENCE PROGRAM

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acc2024.a2c2.org

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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.

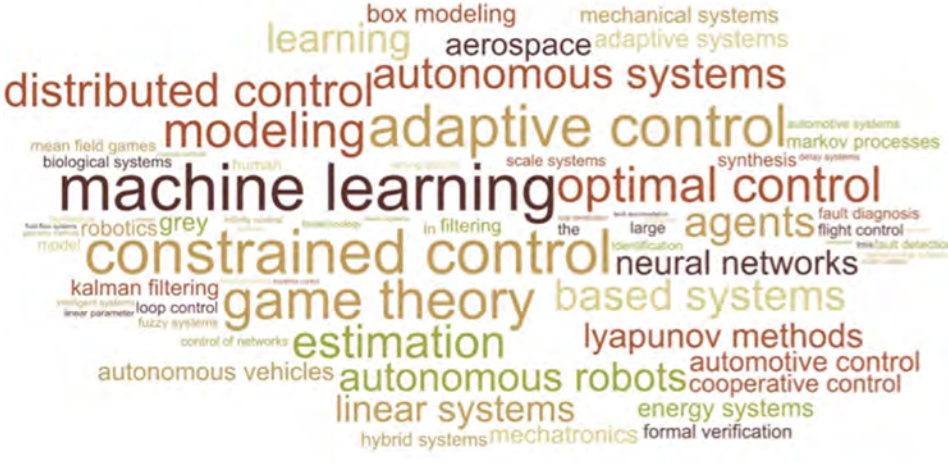
I am grateful for all the critical contributions of the Operating Committee, without whom this all-volunteer conference would not be possible. Program Chair Kam Leang has led the review and construction of the technical program. Thanks to our vibrant community, we had a robust and strong set of submissions. 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 Lecture

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.

Eckman Plenary Lecture

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

Jorge I. Poveda
University of California, San Diego, USA

Thursday, July 11, 10:00 – 11:00
Metro E/C

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.

Plenary Lecture

Automatic Control in the Era of Artificial Intelligence

Francesco Borrelli
University of California, Berkeley, USA

Friday, July 12, 8:30 – 9:30
Metro E/C

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.

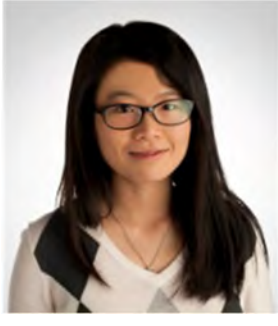
Professor Borrelli's research interests include model predictive control, learning, and their application to robotics, transportation, and energy control systems.

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

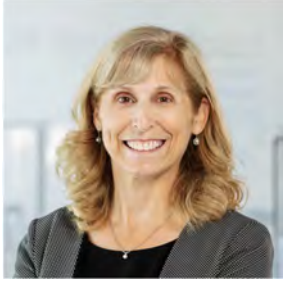
Mengdi Wang, Princeton University
For extraordinary contributions to the intersection of control, dynamic systems, machine learning, and information theory.



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

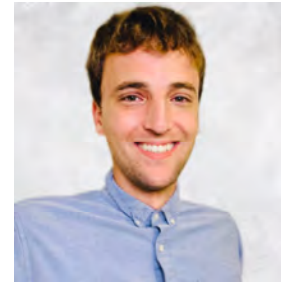
Thomas A. Badgwell, University of Texas, Austin
For lifetime achievement in the development and application of Model Predictive Control technology, and for leadership in the international process control community.

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
"A Physics-informed Deep Learning Approach for Minimum Effort Stochastic Control of Colloidal Self-Assembly," 2023 ACC Proceedings, pages 609-615.

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:

Monday, July 8	12:00 – 17:00
Tuesday, July 9	8:00 –19:00
Wednesday, July 10	8:00 – 17:00
Thursday, July 11	8:00 – 17:00
Friday, July 12	8:00 – 16:00

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.

Registration Categories	**Advance Registration Fee (by June 1st)**	**On-Site or after June 1st Registration Fee**	**Proceedings (Access)**	**Dinner Banquet**
Member	$540	$650	Included	Included
Non-Member	$680	$790	Included	Included
Student/Retiree	$270	$325	Included	Included
One day registration	$400	$400	Not included	Not included

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.

Registration Categories	Advanced Registration (until June 1st)		On-site Registration (after June 1st)	
	Member/ Non-member	Student/ Retiree	Regular	Student/ Retiree
Full day workshop	$240	$120	$280	$140
Half day workshop	$130	$65	$150	$75

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

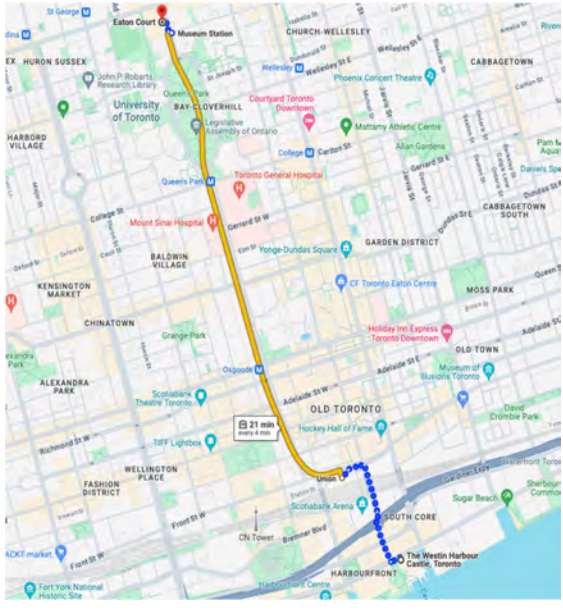
The Royal Ontario Museum (ROM), located at 100 Queens Park, Toronto, is ~3.5km from the conference hotel. The easiest way to get there is using the Subway, which will take approximately 20 minutes door-to-door:

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!

BRONZE SPONSORS

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

and Space Systems, Electromechanical systems, Automotive and Robotics, Integrated Flight and Propulsion Control, Power/Energy Systems and Microgrid Stability and Control Systems with Communication Constraints and others. For more details, please visit www.robustengsys.com

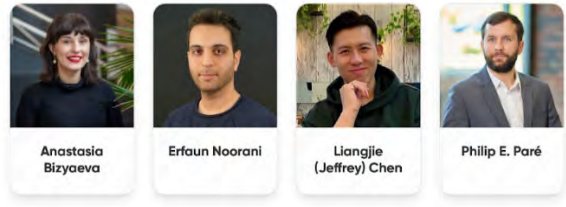
SPECIAL SESSIONS

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, Erfaun 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


Helen Durand

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


Yue Wang


Jordan Berg

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.


Kay Tancock

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


Satadru Dey
The Pennsylvania State University


Damoon Soudbakhsh


Polina Ringler

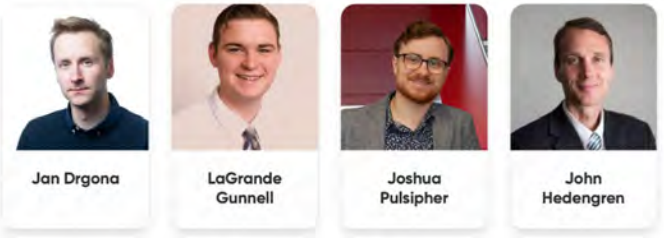

Stephanie Stockar


Ankush Chakrabarty

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

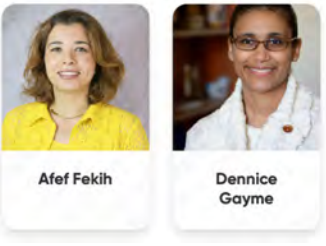
Organizer: **Jan Drgona, LaGrande Gunnell, Joshua Pulsipher, John Hedengren**
Time: 11:30 – 13:00 Wednesday, July 10, 2024
Location: Bay



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

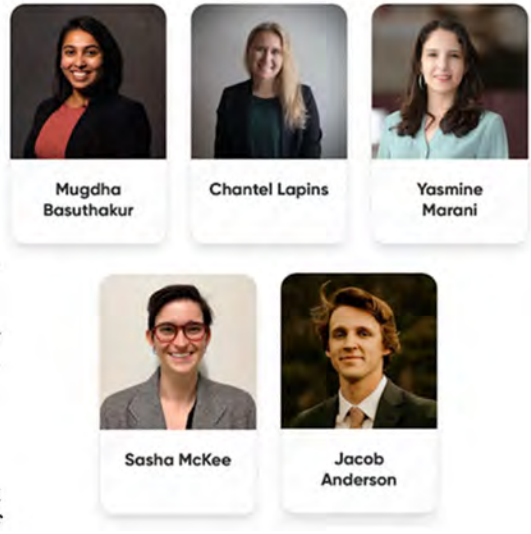


The Women in Control Committee (WiC) is dedicated to empowering and promoting gender diversity in the Control Systems Society (CSS) by facilitating the development of mentoring and programs to promote the retention, recruitment, and growth of women CSS members. The WiC luncheon at ACC 2024 in Toronto, 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.

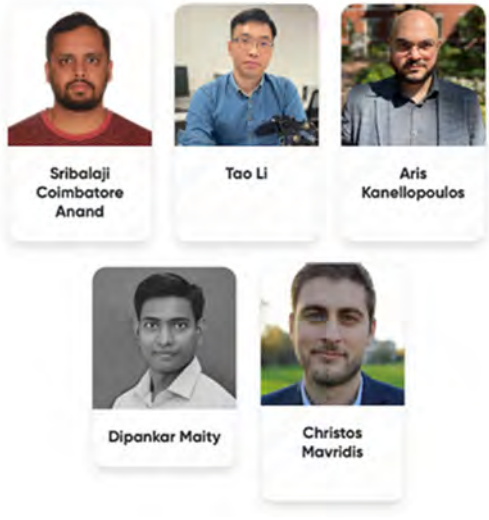


This will be followed by 3 rounds of rotating round-table conversations where, in each round, 7-8 students will have the opportunity for open discussion with a professional for 20 minutes before moving to another table. The final 30 minutes are reserved for open social networking to allow students to 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


Yue Wang


Jordan Berg

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


Victor M. Zavala


Karen Rudie

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

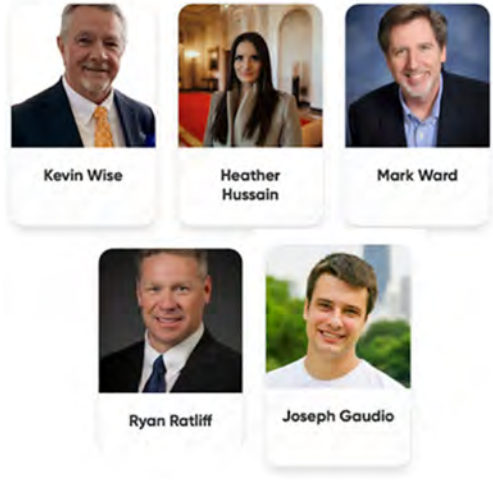
Organizer: **Helen Durand**
Time: 11:30 – 12:30 Thursday, July 11, 2024
Location: Dockside 1


Helen Durand

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.

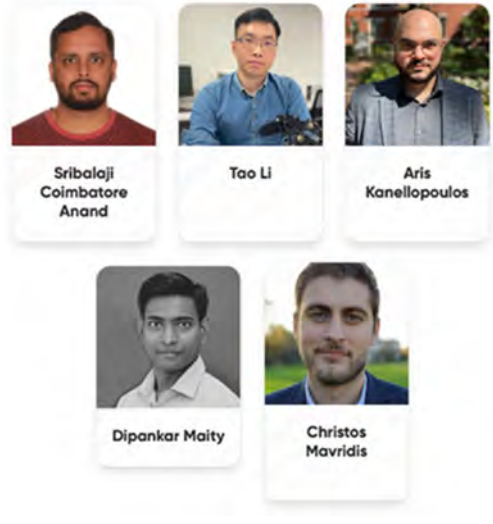
In this talk we present an overview of research activities at MERL, including fundamental research in control and its application to a variety of future products. We discuss fundamental research including model predictive control and control of constrained systems, estimation and motion planning for 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


Helen Durand

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


Shreshta Rajakumar Deshpande


Yan Chen

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

Yang Shi

James Richard Forbes

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

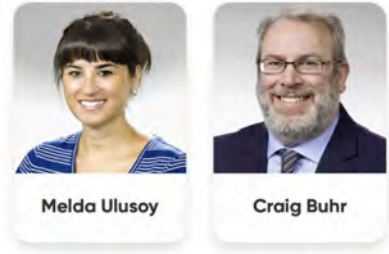
Pramod Khargonekar

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

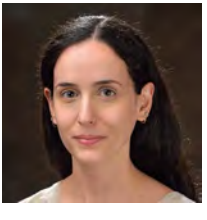
All five finalist papers (see below) will be presented during a special session on Wednesday, July 10, 15:30 – 17:30, in Pier 9. The winner will be selected by the Best Student Paper Awards Committee and will be announced at the AACC Awards Ceremony on Thursday, July 11, 11:45 – 12:45, Frontenac Ballroom.

STUDENT BEST PAPER AWARD FINALISTS

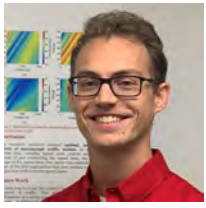
The 2024 ACC is pleased to continue the tradition of the Student Best Paper Award. All primary, first-listed authors of a regular contributed paper who were students at the time of submission were eligible. To be considered for the award, the paper was nominated by the student's advisor in October 2023. 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



Brian Block (Student Author), Stephanie Stockar. *LQ Control of Traffic Flow Models Via Variable Speed Limits,* FrB07.4

Duong Thuy An Nguyen (Student Author), Mattia Bianchi, Florian Dörfler, Duong Tung Nguyen, Angelia Nedich. *Nash Equilibrium Seeking Over Digraphs with Row-Stochastic Matrices and Network-Independent Step-Sizes.* ThC02.1

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

Time	Title	Authors/Presenters
13:30-14:15 WeB08.1	Advanced Methods in Diagnostics and Prognostics	Fabian Mohr, Weike Sun, Richard D. Braatz
14:15-14:30 WeB08.2	Cycle Life Prediction for Lithium-Ion Batteries: Machine Learning and More	Joachim Schaeffer, Giacomo Galuppini, Jinwook Rhyu, Patrick A. Asinger, Robin Droop, Rolf Findeisen, Richard D. Braatz
14:30-14:45 WeB08.3	Prognostics for Chemical Processes	Ivan Castillo, Zhenyu Wang, Leo Chiang
14:45-15:00 WeB08.4	Predictive Analytics for Chemical Processes	Joel Paulson

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

Time	Title	Authors/Presenters
13:30-14:15 ThB08.1	Process Control Evolution and Challenges in Nuclear Power Plants	Kevin Yu, Mark Knutson
14:15-15:00 ThB08.2	Load-Following Control of Nuclear Power Plants in the Age of Small Modular Reactors	Zhibo Zhang, Jin Jiang

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

CANCELLED

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.

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 Sarsılmaz, 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

Number	Poster title	Authors
ThPo1.1	Intelligent System of the Grinding Robot for Spiral Welded Pipe	Ayalew, Getachew Demeissie
ThPo1.2	Advanced Bi-Layer Control System for Continuous Pharmaceutical Manufacturing Pilot-Plant	Singh, Ravendra
ThPo1.3	D-Stability for Discrete Time Closed-Loops Subject to Signal-To-Noise Ratio Constraints	Rojas, Alejandro J.; Barbosa, Karina A.
ThPo1.4	Sampling theorem for exact identification of continuous-time nonlinear systems based on the Koopman operator	Zeng, Zhexuan; Yue, Zuogong; Mauroy, Alexandre; Goncalves, Jorge; Yuan, Ye
ThPo1.5	Latest Results on 24/7 Implementation of Neural Network Based Signal Control for Nimitz Highway in Honolulu	Wang, Hong; Wang, Yiwei; Wang, Chieh (Ross); Shao, Yunli; Zhang, Guohui; Subramaniyan, Arun Bala
ThPo1.6	Data-Driven Controls of a Flapping Wing Unmanned Aerial Vehicle Inspired by Monarch Butterfly	K. C., Tejaswi; Lee, Taeyoung
ThPo1.7	A Simulation Preorder for Koopman-Like Lifted Control Systems	Aspeel, Antoine; Ozay, Necmiye
ThPo1.8	A Direct and Execution-Time-Certified Box-QP Algorithm for Input-Constrained MPC	Wu, Liang; Braatz, Richard D.
ThPo1.9	Improving Positioning Accuracy Using Particle Filter with Enhanced IMU Velocity Estimation	Pisarski, Dominik; Faraj, Rami; Jankowski, Łukasz; Konowrocki, Robert; Poplawski, Blazej
ThPo1.10	A Ball Launching Mechanism for Real-Time Control Education	Moallem, Mehrdad; Mohagheghi, Afagh
ThPo1.11	Deep Monocular Relative 6D Pose Estimation for Ship-Based Autonomous UAV	Wickramasuriya, Maneesha; Lee, Taeyoung; Snyder, Murray

Number	Poster title	Authors
ThPo1.12	Uniform Exponential Stability in Finite-Difference Model Reduction for Magnetizable Piezoelectric Beams with Non-Collocated Observers	Rasaq, Uthman; Khalilullah, Sk Md Ibrahim; Walterman, Jacob; Ozer, Ahmet Ozkan
ThPo1.13	FPGA-Accelerated Particle Filter for High-Speed Target Localization in Edge Computing Devices	Kim, Daeyeon; Kim, Nayeon; Lee, Heoncheol; Choi, Wonseok; Jeong, Bora; Cho, Youngki
ThPo1.14	Reinforcement Learning Enables Extreme Vehicle Lateral Maneuvers	Yechiel, Oded; Suplin, Vladimir
ThPo1.15	Unlocking Floating Offshore Wind Potential: Layout Modification for Power Maximization	Niu, Yue; Nagamune, Ryozo
ThPo1.16	Enhancing Nonlinear Chemical Process Monitoring with Neural Component Analysis Based Singular Spectrum Analysis (SSA-NCA)	Ndunda, Enock; Krishnannair, Syamala
ThPo1.17	A Superstructure Design for Sustainable Hydrogen Byproduct Production and CO2 Emission Mitigation	Khaligh, Vahid; Ghezelbash, Azam; Niaz, Haider; Liu, Jay
ThPo1.18	Dynamic Extended-Output Observer Design for an Adaptive Vertical Farm Quadcopter	Chnib, Echrak; Bagnerini, Patrizia; Gaggero, Mauro; Zemouche, Ali
ThPo1.19	Deep Reinforcement Learning Based Tracking Control of van de Vusse Reactor	Ankalugari, Rahul Yadav; M U, Abuthahir; Magbool Jan, Nabil; Joseph, Ajin George
ThPo1.20	Temperature Estimation in Lithium-Ion Batteries through Cascaded Electrochemical-Thermal Models	Ferreira, Patryck; Tang, Shuxia
ThPo1.21	TUM CONTROL: Open Source Controller-Vehicle in Loop Simulation Framework for ultra-Rapid prototyping in Python	Zarrouki, Baha; Betz, Johannes

Number	Poster title	Authors
ThPo1.22	Deep Reinforcement Learning Driven Adaptive Stochastic NMPC Reduces Conservatism, Enhances Feasibility and Improves Closed-Loop Performance	Zarrouki, Baha; Wang, Chenyang; Betz, Johannes
ThPo1.23	Safe Deep Reinforcement Learning (RL) Agent Adapts the Cost Function Weights of a Weights-Varying MPC (WMPC)	Zarrouki, Baha; Spanakakis, Marios; Betz, Johannes
ThPo1.24	Noncontact Magnetic Manipulation Using Permanent Magnets	Ekanayake, Lahiru; Weerasekara Mudiyanselage, Janaka Madhusankha; Basnet, Dhiraj; Komaee, Arash
ThPo1.25	Algebraic Prescribed-Time KKL Observer for Autonomous Nonlinear Systems	Marani, Yasmine; N'Doye, Ibrahima; Laleg-Kirati, Taous-Meriem
ThPo1.26	Uncertainty Quantification in Physiological Modeling Using Bayesian Variational Autoencoders	Estiri, Elham; Mirinejad, Hossein
ThPo1.27	Reinforcement Learning and Nonlinear Integrated Controller for Guaranteed Local Stability	Nan, Shiqi; Chen, Chih-Chiang; Qian, Chunjiang
ThPo1.28	Benchmarking Surrogate Embedding Strategies for Model Predictive Control	Elorza Casas, Carlos Andres; Pulsipher, Joshua; Ricardez-Sandoval, Luis
ThPo1.29	Properties of Immersions for Systems with Multiple Limit Sets with Implications to Learning Koopman Embeddings	Liu, Zexiang; Ozay, Necmiye; Sontag, Eduardo
ThPo1.30	Particle Swarm Optimization for Training Quadrotor PID Controller	Rodriguez, Eric; Dong, Wenjie; Lu, Qi
ThPo1.31	On Control-Sync Technique for Multi-Task System Operation	Fateh, Fariba; Mirafzal, Behrooz
ThPo1.32	Staggered Steering of Wheeled-Legged Biped Robot	Montufar, Sergio; Qian, William

Number	Poster title	Authors
ThPo1.33	Information-Based Anomaly Detection for Autonomous Agents	McKee, Sasha M; Haddadin, Osama; Leang, Kam K.
ThPo1.34	Estimating the Lateral Stability Region of the Vehicle Using the Koopman Spectrum	Kumar, Alok; Umathe, Bhagyashree; Vaidya, Umesh; Kelkar, Atul
ThPo1.35	Self Organized Neural Network for Swarm Robots	Han, Zhifeng; Walton, Claire
ThPo1.36	Deep Neural Network In-Proximity Effect Detection and Collision Avoidance for Aerial Vehicles	M Anderson, Jacob; Leang, Kam K.
ThPo1.37	Distribution-Matching Deployment: A Stein Variational Gradient Approach to Optimal Multisensor Placement	Ghimire, Donipolo; Kia, Solmaz S.
ThPo1.38	Real Application of Deep Reinforcement Learning for multi-agent Cooperation in Distributed Model-Based Predictive Control.	Aponte Rengifo, Oscar Emilio; Francisco, Mario; Vega Cruz, Pastora
ThPo1.39	Improving Drone Control: Achieving Strong Stability and Adaptability Using Online Reinforcement Learning	Avila, Ethan; Jaber, Halah; Frye, Michael
ThPo1.40	Parameter Design of P-PI Controller for Motion Control Systems Using Limited Pole Placement Methd	Urakawa, Yoshiyuki; Ngamlamai, Sirichai
ThPo1.41	Cyber-Attack Detection by Using a Discrete-Time Model-Based Unknown Input Observer	Nguyen, Quang Huy; Sadki, Osama; Rafaralahy, Hugues; Haddad, Madjid; Zemouche, Ali
ThPo1.42	Closed-Loop Battery Manufacturing Process Control via End-of-Line Formation Features	Weng, Andrew; Less, Greg; Siegel, Jason B.; Stefanopoulou, Anna G.
ThPo1.43	Integrating Dynamic Risk Assessment with Model Predictive Control for Enhanced Safety and Operational Efficiency	Akundi, Sahithi Srijana; Liu, Yuanxing; Braniff, Austin; Dantas, Beatriz; Niknezhad, Shayan Sean; Tian, Yuhe; Khan, Faisal; Pistikopoulos, Efstratios N.

DAILY OVERVIEW OF EVENTS/ACTIVITIES

MONDAY OVERVIEW

Time	Key Events
Afternoon	Workshop 13. Please see the *Workshops* section for more information on the Monday workshops.

TUESDAY OVERVIEW

Time	Key Events
8:30 – 17:30	Workshops 1-3, 5-11, and AACC Bystander Training Workshop. Please see the *Workshops* section for more information on the Tuesday full-day workshops.
Afternoon	Workshop 4 and 12. Please see the *Workshops* section for more information on the Tuesday half-day workshops.
18:30 – 20:30	Opening Reception, Harbour Ballroom

WEDNESDAY OVERVIEW

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

	● 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)
13:30 – 15:00	Mid-Day Technical Sessions
15:00 – 15:30	Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)
15:30 – 17:00	Late Afternoon Technical Sessions
15:30 – 17:00	Student Best Paper Award Session (Pier 9) – Please see Student Programs section for details
17:30 – 19:30	Special Session: Student networking event at ACC 2024 (17:30 – 19:30, Metro W)

THURSDAY OVERVIEW

Time	Key Events
07:30 – 08:30	Special Session: Student Breakfast (Part I) – Security and Privacy of the Next-Generation Cyber-Physical Systems (Dockside 1)
08:30 – 09:30	Plenary Session (see *Plenary Sessions,* Metro E/C) "A Control Systems Approach to Cell Fate Reprogramming", Domitilla Del Vecchio, Massachusetts Institute of Technology, USA.
09:30 – 10:00	Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)
10:00 – 11:00	Eckman Plenary Lecture (see *Plenary Sessions,* Metro E/C) "Hybrid Dynamical Seeking Systems: Model-Free Feedback Decision-Making and Control", Jorge I. Poveda, University of California, San Diego, USA
11:00 – 11:45	Late-breaking News Poster Session (Metro, Harbour, and Frontenac Ballrooms)
11:45 – 12:45	Awards Ceremony (Frontenac Ballroom)

11:30 – 13:15	Special Sessions (see *Special Sessions and Student Programs*) ● Industry Lunch: MERL: Fundamental Research with Real-World Impact (12:00 – 13:15, Pier 2) ● Fostering JEDI in the Controls Community (11:30 – 12:30, Queens Quay 1) ● Industry session session: The Boeing Company (12:00 – 13:15, Queens Quay 2) ● Getting funded by NSF: Proposal preparation and the merit review process (11:30 – 13:15, Bay) ● How to make a STEM outreach film (11:30 – 12:30, Dockside 1)
13:30 – 15:00	Mid-Day Technical Sessions
15:00 – 15:30	Coffee Break (Dockside Foyer, Pier/Harbour Foyer, and Frontenac Area)
15:30 – 17:00	Late Afternoon Technical Sessions
18:30 – 21:30	Conference banquet at the Royal Ontario Museum

FRIDAY OVERVIEW

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

2024 American Control Conference

TECHNICAL PROGRAM

Program at a Glance

ACC 2024 Technical Program Wednesday July 10, 2024

08:15-08:30
2024 ACC Opening Remarks
Metro E/C

08:30-09:30 WeP1
Plenary Lecture
Control of Uncrewed Vehicle Systems – from Unconventional Flyers to Maritime Autonomy
Metro E/C

Track 1	Track 2	Track 3	Track 4
10:00-11:03 WeA01 Metro E/C RI: Machine Learning in Control	10:00-11:03 WeA02 Harbour RI: Network and Multi-Agent Systems	10:00-11:03 WeA03 Frontenac RI: Autonomous Robots and Systems	10:00-11:03 WeA04 Metro W RI: Modeling, Estimation, and System Identification

Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8	Track 9	Track 10	Track 11	Track 12	Track 13	Track 14	Track 15	Track 16	Track 17	Track 18	Track 19	Track 20	Track 21
13:30-15:00 WeB01 Metro E/C Machine Learning I	13:30-15:00 WeB02 Harbour Network Control Systems I	13:30-15:00 WeB03 Frontenac Autonomous Robots I	13:30-15:00 WeB04 Metro W Estimation and Identification I	13:30-15:00 WeB05 Pier 2 Optimization I	13:30-15:00 WeB06 Queens Quay 1 Control of Large-Scale Battery Energy Storage Systems	13:30-15:00 WeB07 Queens Quay 2 Safety of Advanced Driver Assistance Systems and Automated Driving Systems	13:30-15:00 WeB08 Bay Advanced Methods in Diagnostics and Prognostics	13:30-15:00 WeB09 Dockside 1 Aerospace Systems	13:30-15:00 WeB10 Dockside 2 Control of Cyber-Physical Systems: Multidisciplinary Approaches in Robotics, Autonomy, Optimization, and Safety	13:30-15:00 WeB11 Dockside 3 Game Theory I	13:30-15:00 WeB12 Dockside 9 Predictive Control for Nonlinear Systems I	13:30-15:00 WeB13 Richmond Constrained Control I	13:30-15:00 WeB14 Wellington Modeling, Control and Estimation of Soft Material and Continuum Systems	13:30-15:00 WeB15 Yonge Estimation and Control of Distributed Parameter Systems I	13:30-15:00 WeB16 Dockside 4 Wind Turbines and Wind Farms	13:30-15:00 WeB17 Dockside 5 Cooperative Control	13:30-15:00 WeB18 Dockside 6 Stability of Linear Systems	13:30-15:00 WeB19 Pier 7 Robust Control I	13:30-15:00 WeB20 Pier 8 Kalman Filtering	13:30-15:00 WeB21 Pier 3 Linear Systems
Track 1	**Track 2**	**Track 3**	**Track 4**	**Track 5**	**Track 6**	**Track 7**	**Track 8**	**Track 9**	**Track 10**	**Track 11**	**Track 12**	**Track 13**	**Track 14**	**Track 15**	**Track 16**	**Track 17**	**Track 18**	**Track 19**	**Track 20**	**Track 21**
15:30-17:00 WeC01 Metro E/C Machine Learning II	15:30-17:00 WeC02 Harbour Network Control Systems II	15:30-17:00 WeC03 Frontenac Autonomous Robots II	15:30-17:00 WeC04 Metro W Estimation and Identification II	15:30-17:00 WeC05 Pier 2 Optimization II	15:30-17:00 WeC06 Queens Quay 1 Modeling and State Estimation for Batteries	15:30-17:00 WeC07 Queens Quay 2 Traffic Control I	15:30-17:00 WeC08 Bay Fault Diagnosis	15:30-17:00 WeC09 Dockside 1 Flight Control	15:30-17:00 WeC10 Dockside 2 Adaptive Control I	15:30-17:00 WeC11 Dockside 3 Game Theory II	15:30-17:00 WeC12 Dockside 9 Predictive Control for Nonlinear Systems II	15:30-17:00 WeC13 Richmond Constrained Control II	15:30-17:00 WeC14 Wellington Advanced Control for Safe Process Operations	15:30-17:00 WeC15 Yonge Estimation and Control of Distributed Parameter Systems II	15:30-17:00 WeC16 Dockside 4 Smart Grid	15:30-17:00 WeC17 Dockside 5 Distributed Control I	15:30-17:00 WeC18 Dockside 6 Stability of Nonlinear Systems I	15:30-17:00 WeC19 Pier 7 Robust Control II	15:30-17:00 WeC20 Pier 8 Filtering	15:30-17:00 WeC21 Pier 3 Parameter Identification for Battery Systems

ACC 2024 Technical Program Thursday July 11, 2024

08:30-09:30 ThP1
Plenary Lecture
A Control Systems Approach to Cell Fate Reprogramming
Metro E/C

10:00-11:00 ThE1
Eckman Plenary Lecture
Hybrid Dynamical Seeking Systems: Model-Free Feedback Decision-Making and Control
Metro E/C

11:00-11:45 ThPo1
Late Breaking Poster Session
Metro, Harbour, Frontenac Ballrooms

Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8	Track 9	Track 10	Track 11	Track 12	Track 13	Track 14	Track 15	Track 16	Track 17	Track 18	Track 19	Track 20	Track 21
13:30-15:00 ThB01 Metro E/C Agents-Based Systems I	13:30-15:00 ThB02 Harbour Optimization, Consensus, and Games I: Constraints and Distributed Computation	13:30-15:00 ThB03 Frontenac Mechatronics I	13:30-15:00 ThB04 Metro W Estimation and Identification III	13:30-15:00 ThB05 Pier 2 Optimization III	13:30-15:00 ThB06 Queens Quay 1 Modeling and Control of Energy Storage and Conversion Systems	13:30-15:00 ThB07 Queens Quay 2 Traffic Control II	13:30-15:00 ThB08 Bay Process Control Evolution and Challenges in Nuclear Power Plants	13:30-15:00 ThB09 Dockside 1 Autonomy, Learning, and Optimization for Spacecraft	13:30-15:00 ThB10 Dockside 2 Adaptive Control II	13:30-15:00 ThB11 Dockside 3 Autonomous Systems I	13:30-15:00 ThB12 Dockside 9 Predictive Control for Linear Systems I	13:30-15:00 ThB13 Richmond Constrained Control III	13:30-15:00 ThB14 Wellington Set-Based Methods in Dynamic Systems and Control	13:30-15:00 ThB15 Yonge Estimation and Control of Distributed Parameter Systems III	13:30-15:00 ThB16 Dockside 4 Control Co-Design for Energy Systems	13:30-15:00 ThB17 Dockside 5 Distributed Control II	13:30-15:00 ThB18 Dockside 6 Stability of Nonlinear Systems II	13:30-15:00 ThB19 Pier 7 Uncertain Systems I	13:30-15:00 ThB20 Pier 8 Sensors and Sensing Systems	13:30-15:00 ThB21 Pier 3 Reduced-Order Modeling and Numerical Algorithms
Track 1	**Track 2**	**Track 3**	**Track 4**	**Track 5**	**Track 6**	**Track 7**	**Track 8**	**Track 9**	**Track 10**	**Track 11**	**Track 12**	**Track 13**	**Track 14**	**Track 15**	**Track 16**	**Track 17**	**Track 18**	**Track 19**	**Track 20**	**Track 21**
15:30-17:00 ThC01 Metro E/C Agents-Based Systems II	15:30-17:00 ThC02 Harbour Optimization, Consensus, and Games II: Networked Agents	15:30-17:00 ThC03 Frontenac Robotics I	15:30-17:00 ThC04 Metro W Nonlinear Systems Identification	15:30-17:00 ThC05 Pier 2 Optimization IV	15:30-17:00 ThC06 Queens Quay 1 Power Systems and Electronics	15:30-17:00 ThC07 Queens Quay 2 Control Solutions for Enhancing the Efficiency and Adoption of Electric Vehicles	15:30-17:00 ThC08 Bay Process Control	15:30-17:00 ThC09 Dockside 1 Multi-Agent Spacecraft Control	15:30-17:00 ThC10 Dockside 2 Adaptive Control III	15:30-17:00 ThC11 Dockside 3 Autonomous Systems II	15:30-17:00 ThC12 Dockside 9 Predictive Control for Linear Systems II	15:30-17:00 ThC13 Richmond Advanced Methods in Control	15:30-17:00 ThC14 Wellington Risk-Aware Design and Control	15:30-17:00 ThC15 Yonge Estimation and Control of Distributed Parameter Systems IV	15:30-17:00 ThC16 Dockside 4 Dynamics and Control of Wave Energy Converters	15:30-17:00 ThC17 Dockside 5 Modeling and Identification I	15:30-17:00 ThC18 Dockside 6 Stability of Nonlinear Systems III	15:30-17:00 ThC19 Pier 7 Uncertain Systems II	15:30-17:00 ThC20 Pier 8 Observers for Linear Systems	15:30-17:00 ThC21 Pier 3 Fault Detection and Monitoring of Energy Storage Systems for Increased Safety and Cycle

ACC 2024 Technical Program Friday July 12, 2024

08:30-09:30 FrP1
Plenary Lecture
Metro E/C
Automatic Control in the Era of Artificial Intelligence

Track 1					Track 2					Track 3						Track 4				
10:00-11:03 FrA01 Metro E/C RI: Learning and Optimization					10:00-11:03 FrA02 Harbour RI: Advances in Optimal Control					10:00-11:03 FrA03 Frontenac RI: Control of Robotic and Mechatronic Systems						10:00-11:03 FrA04 Metro W RI: Stochastic and Nonlinear Systems				
Track 1	**Track 2**	**Track 3**	**Track 4**	**Track 5**	**Track 6**	**Track 7**	**Track 8**	**Track 9**	**Track 10**	**Track 11**	**Track 12**	**Track 13**	**Track 14**	**Track 15**	**Track 16**	**Track 17**	**Track 18**	**Track 19**	**Track 20**	**Track 21**
13:30-15:00 FrB01 Metro E/C Learning	13:30-15:00 FrB02 Harbour Optimal Control I	13:30-15:00 FrB03 Frontenac Mechatronics II	13:30-15:00 FrB04 Metro W Autonomous Planning and Control	13:30-15:00 FrB05 Pier 2 Information-Theoretic Control	13:30-15:00 FrB06 Queens Quay 1 Decentralized Control	13:30-15:00 FrB07 Queens Quay 2 Modeling and Control of Alternative Powertrains and Mobility Systems	13:30-15:00 FrB08 Bay Control Applications I	13:30-15:00 FrB09 Dockside 1 Recent Advancements in Data-Driven Decision-Making and Control	13:30-15:00 FrB10 Dockside 2 Adaptive Systems	13:30-15:00 FrB11 Dockside 3 Spreading Processes in Complex Networks: Analysis, Control and Observability	13:30-15:00 FrB12 Dockside 9 Chemical Process Control	13:30-15:00 FrB13 Richmond Manufacturing and Precision Mechatronic Systems	13:30-15:00 FrB14 Wellington ASME-IEEE Joint Invited Session on Healthcare and Medical Systems	13:30-15:00 FrB15 Yonge Estimation and Control of Distributed Parameter Systems V	13:30-15:00 FrB16 Dockside 4 Modeling and Control for Thermal Management Systems	13:30-15:00 FrB17 Dockside 5 Modeling and Identification II	13:30-15:00 FrB18 Dockside 6 Hybrid Systems	13:30-15:00 FrB19 Pier 7 Stochastic Systems and Control I	13:30-15:00 FrB20 Pier 8 Observers for Nonlinear Systems	13:30-15:00 FrB21 Pier 3 Lyapunov Methods
Track 1	**Track 2**	**Track 3**	**Track 4**	**Track 5**	**Track 6**	**Track 7**	**Track 8**	**Track 9**	**Track 10**	**Track 11**	**Track 12**	**Track 13**	**Track 14**	**Track 15**	**Track 16**	**Track 17**	**Track 18**	**Track 19**	**Track 20**	
15:30-17:00 FrC01 Metro E/C Convergence Behavior and Applications in Iterative Learning Control	15:30-17:00 FrC02 Harbour Optimal Control II	15:30-17:00 FrC03 Frontenac Robotics II	15:30-17:00 FrC04 Metro W Autonomous Vehicles	15:30-17:00 FrC05 Pier 2 Computational Methods	15:30-17:00 FrC06 Queens Quay 1 Large-Scale Systems	15:30-17:00 FrC07 Queens Quay 2 Automotive Control	15:30-17:00 FrC08 Bay Control Applications II	15:30-17:00 FrC09 Dockside 1 Data-Driven Modeling and Control	15:30-17:00 FrC10 Dockside 2 Neural Networks	15:30-17:00 FrC11 Dockside 3 Sampled-Data Control	15:30-17:00 FrC12 Dockside 9 Network Analysis and Control	15:30-17:00 FrC13 Richmond Mechatronic Systems	15:30-17:00 FrC14 Wellington Biological Systems	15:30-17:00 FrC15 Yonge Distributed Parameter Systems	15:30-17:00 FrC16 Dockside 4 Energy Systems	15:30-17:00 FrC17 Dockside 5 Modeling and Identification III	15:30-17:00 FrC18 Dockside 6 Discrete Event Systems	15:30-17:00 FrC19 Pier 7 Stochastic Systems and Control II	15:30-17:00 FrC20 Pier 8 Delay Systems	

2024 American Control Conference

TECHNICAL PROGRAM

Detailed Program Listing

Technical Program for Wednesday July 10, 2024

WePI	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

Control of Uncrewed Vehicle Systems – from Unconventional Flyers to Maritime Autonomy, pp. 1-1.

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

A Physics-Informed Machine Learning Approach to Predict Soil Water Content for Agricultural Decision-Making, pp. 2-7.

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 Stochastic Systems, pp. 21-26.

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; Baharisangari, 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

Empowering Hybrid Models with Attention-Based Time-Series Transformers: A Case Study in Batch Crystallization, pp. 62-67.

Sitapure, Niranjan; Kwon, Joseph

10:33-10:36 WeA01.12

An Example of Synthetic Data Generation for Control Systems Using Generative Adversarial Networks: Zermelo Minimum-Time Navigation, pp. 68-73.

Bapat, Nachiket; Paffenroth, Randy C.; Cowlagi, Raghvendra V.

10:36-10:39 WeA01.13

Safe Reinforcement Learning Using Model Predictive Control with Probabilistic Control Barrier Function, pp. 74-79.

Shen, Xun; Wachi, Akifumi; Hashimoto, Wataru; Hashimoto, Kazumune; Takai, Shigemasa

10:39-10:42 WeA01.14

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

Adibi, Arman; Mitra, Aritra; Hassani, Hamed

10:42-10:45 WeA01.15

Developing an Efficient Model for a SOFC System Using Self-Supervised Convolutional Autoencoder and Stateful LSTM Network, pp. 86-91.

Tofigh, Mohamadali; Salehi, Zeynab; Smith, Daniel; Ali, Kharazmi; Amir, Hanifi Yazdi; Koch, Charles Robert; Shahbakhti, Mahdi

10:45-10:48 WeA01.16

Data-Driven Nonlinear System Identification of a Throttle Valve Using Koopman Representation, pp. 92-97.

Bongiovanni, Nicolas; Mavkov, Bojan; Martins, Renato; Allibert, Guillaume

10:48-10:51 WeA01.17

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

Kakuko, Norihiro; Parizy, Matthieu

10:51-10:54 WeA01.18

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

Wu, Xinyang; Wedernikow, Elisabeth; Huber, Marco

10:54-10:57 WeA01.19

Fast Long-Term Multi-Scenario Prediction for Maneuver Planning at Unsignalized Intersections, pp. 111-116.

Mertens, Max Bastian; Ruof, Jona; Strohbeck, Jan; Buchholz, Michael

WeA02 Harbour

RI: Network and Multi-Agent Systems (RI Session)

Chair: Kumar, Gautam — San Jose State University

Co-Chair: Yuan, Yukun — University of Tennessee at Chattanooga

10:00-10:03 WeA02.1

A Model of Chaperone Competition in Bacterial Gene Regulatory Networks, pp. 117-122.

Nolan, Nicholas; Laub, Michael; Del Vecchio, Domitilla

10:03-10:06 WeA02.2

Opinion-Based Task Allocation Strategy for Mobile Sensor Networks, pp. 123-128.

Zhang, Ziqiao; Wu, Wencen; Zhang, Fumin

10:06-10:09 WeA02.3

Multi-Agent Deep Reinforcement Learning for Energy Management in Grid-Responsive Networked Greenhouses, pp. 129-134.

Ajagekar, Akshay; Decardi-Nelson, Benjamin; You, Fengqi

10:09-10:12 WeA02.4

Optimization-Based Countering of Misinformation on Social Networks, pp. 135-142.

Bayiz, Yigit Ege; Topcu, Ufuk

10:12-10:15 WeA02.5

Distributed Multi-Agent Interaction Generation with Imagined Potential Games, pp. 143-150.

Sun, Lingfeng; Hung, Pin-Yun; Wang, Changhao; Tomizuka, Masayoshi; Xu, Zhuo

10:15-10:18 WeA02.6

Control of Misinformation with Safety and Engagement Guarantees, pp. 151-158.

Amini, Arash; Bayiz, Yigit Ege; Topcu, Ufuk

10:18-10:21 WeA02.7

Controllability-Constrained Deep Network Models for Enhanced Control of Dynamical Systems, pp. 159-166.

Sharma, Suruchi; Makarenko, Volodymyr; Kumar, Gautam; Tiomkin, Stas

10:21-10:24 WeA02.8

A Mixing-Accelerated Primal-Dual Proximal Algorithm for Distributed Nonconvex Optimization, pp. 167-172.

Ou, Zichong; Qiu, Chenyang; Wang, Dandan; Lu, Jie

10:24-10:27 WeA02.9

Consensus Control with Safety Guarantee: An Application to the Kinematic Bicycle Model, pp. 173-179.

Niu, Kaicheng; Abdallah, Chaouki T.; Hayajneh, Mohammad

10:27-10:30 WeA02.10

An Auxiliary Graph for Clock Rigidity Analysis, pp. 180-185.

Wen, Ruixin; Schoof, Eric; Chapman, Airlie

10:30-10:33 WeA02.11

Distributed Least-Squares Optimization Solvers with Differential Privacy, pp. 186-191.

Liu, Weijia; Wang, Lei; Guo, Fanghong; Wu, Zheng-Guang; Su, Hongye

10:33-10:36 WeA02.12

Leveraging Untrustworthy Commands for Multi-Robot Coordination in Unpredictable Environments: A Bandit Submodular Maximization Approach, pp. 192-199.

Xu, Zirui; Lin, Xiaofeng; Tzoumas, Vasileios

10:36-10:39 WeA02.13

Controlled Sensing for Communication-Efficient Filtering and Smoothing in POMDPs, pp. 200-207.

Liu, Changrong; Molloy, Timothy L.; Nair, Girish N.

10:39-10:42 WeA02.14

Distributed Model Predictive Control of Integrated Process Networks Based on an Adaptive Community Detection Approach, pp. 208-213.

Ebrahimi, AmirMohammad; Babaei Pourkargar, Davood

10:42-10:45 WeA02.15

Fairness-Aware Electric Taxi Fleet Coordination under Short-Term Power System Failures, pp. 214-219.

Yuan, Yukun; Ding, Zihan; Lin, Shan

10:45-10:48 WeA02.16

A Geometric Approach to Resilient Distributed Consensus Accounting for State Imprecision and Adversarial Agents, pp. 220-225.

Lee, Christopher; Abbas, Waseem

10:48-10:51 WeA02.17

Synchronize the Parafoil and the Vessel: A Hierarchical Distributed Nonlinear Model Predictive Control Approach, pp. 226-232.

Wei, Zhenyu; Gao, Yan; Shao, Zhijiang

10:51-10:54 WeA02.18

Guarding a Target Area from a Heterogeneous Group of Cooperative Attackers, pp. 233-238.

Lee, Yoonjae; Das, Goutam; Shishika, Daigo; Bakolas, Efstathios

10:54-10:57 WeA02.19

Heterogeneous Multi-Agent Reinforcement Learning Based on Adaptive Curiosity for Traffic Signal Control, pp. 239-244.

Pan, Yue; Lei, Jinlong; Yi, Peng

WeA03 Frontenac

RI: Autonomous Robots and Systems (RI Session)

Chair: Leang, Kam K. University of Utah

Co-Chair: Beard, Randal W. Brigham Young Univ

10:00-10:03 WeA03.1

On XYZ-Motion Planning Using a Full Car Model, pp. 245-250.

Chakraborty, Sayan; Jiang, Yu; Jiang, Zhong-Ping

10:03-10:06 WeA03.2

Temporally Robust Multi-Agent STL Motion Planning in Continuous Time, pp. 251-258.

Verhagen, Joris; Lindemann, Lars; Tumova, Jana

10:06-10:09 WeA03.3

Structure from WiFi (SfW): RSSI-Based Geometric Mapping of Indoor Environments, pp. 259-264.

Kim, Junseo; Aghyourli Zalat, Jill; Bahoo, Yeganeh; Saeedi, Sajad

10:09-10:12 WeA03.4

Tracking Control of Optical Beam Transceivers Using Mean Field Models, pp. 265-271.

N'Doye, Ibrahima; Laleg-Kirati, Taous-Meriem

10:12-10:15 WeA03.5

Practical Considerations for Discrete-Time Implementations of Continuous-Time Control Barrier Function-Based Safety Filters, pp. 272-278.

Brunke, Lukas; Zhou, Siqi; Che, Mingxuan; Schoellig, Angela P

10:15-10:18 WeA03.6

Model Predictive Control with Reference Path Planning for Multi-UAV Formation Control System, pp. 279-284.

Chen, YuWen; Chiang, Ming-Li; Kuo, Guo-Rong; Chuang, Che-Jung; Fu, Li-Chen

10:18-10:21 WeA03.7

Interaction-Aware Decision-Making for Autonomous Vehicles in Forced Merging Scenario Leveraging Social Psychology Factors, pp. 285-291.

Li, Xiao; Liu, Kaiwen; Tseng, H. Eric; Girard, Anouck; Kolmanovsky, Ilya V.

10:21-10:24 WeA03.8

An Optimal Control Framework for Influencing Human Driving Behavior in Mixed-Autonomy Traffic, pp. 292-298.

Chari, Anirudh; Chen, Rui; Grover, Jaskaran; Liu, Changliu

10:24-10:27 WeA03.9

Data-Driven Monitoring with Mobile Sensors and Charging Stations Using Multi-Arm Bandits and Coordinated Motion Planners, pp. 299-305.

Nayak, Siddharth; Greiff, Marcus Carl; Raghunathan, Arvind; Di Cairano, Stefano; P. Vinod, Abraham

10:27-10:30 WeA03.10

Coupled Sensor Configuration and Planning in Unknown Dynamic Environments with Context-Relevant Mutual Information-Based Sensor Placement, pp. 306-311.

Poudel, Prakash; Cowlagi, Raghvendra V.

10:30-10:33 WeA03.11

Safe Stabilizing Control for Polygonal Robots in Dynamic Elliptical Environments, pp. 312-317.

Long, Kehan; Tran, Khoa; Leok, Melvin; Atanasov, Nikolay

10:33-10:36 WeA03.12

Aircraft Approach Management Using Reachability and Dynamic Programming, pp. 318-324.

P. Vinod, Abraham; Yamazaki, Sachiyo; Chakrabarty, Ankush; Yoshikawa, Nobuyuki; Di Cairano, Stefano

10:36-10:39 WeA03.13

Collision Cone Control Barrier Functions: Experimental Validation on UGVs for Kinematic Obstacle Avoidance, pp. 325-331.

Goswami, Bhavya Giri; Tayal, Manan; Rajgopal, Karthik; Jagtap, Pushpak; Nadubettu Yadukumar, Shishir

10:39-10:42 WeA03.14

Avoidance of Constant Velocity Targets Using Bearing and Time-To-Collision, pp. 332-337.

Adams, James J.; Liu, Jen Jui; Beard, Randal W.

10:42-10:45 WeA03.15

Achieving and Maintaining Inverted Pose for Miniature Autonomous Blimps, pp. 338-343.

Wang, Junkai; Zhang, Fumin

10:45-10:48 WeA03.16

Safe Control Synthesis for Hybrid Systems through Local Control Barrier Functions, pp. 344-351.

Yang, Shuo; Black, Mitchell; Fainekos, Georgios; Hoxha, Bardh; Okamoto, Hideki; Mangharam, Rahul

10:48-10:51 WeA03.17

Real-Time Trajectory Generation Via Dynamic Movement Primitives for Autonomous Racing, pp. 352-359.

Weaver, Catherine; Capobianco, Roberto; Wurman, Peter; Stone, Peter; Tomizuka, Masayoshi

10:51-10:54 WeA03.18

Encouraging Inferable Behavior for Autonomy: Repeated Bimatrix Stackelberg Games with Observations, pp. 360-366.

Karabag, Mustafa O.; Smith, Sophia; Fridovich-Keil, David; Topcu, Ufuk

10:54-10:57 WeA03.19

Where to Drop Sensors from Aerial Robots to Monitor a Surface-Level Phenomenon, pp. 367-374.

Shek, Chak Lam; Shi, Guangyao; Asghar, Ahmad Bilal; Tokekar, Pratap

10:57-11:00 WeA03.20

Leveraging Computational Fluid Dynamics in UAV Motion Planning, pp. 375-381.

Huang, Yunshen; Greiff, Marcus Carl; P. Vinod, Abraham; Di Cairano, Stefano

WeA04 Metro W

RI: Modeling, Estimation, and System Identification (RI Session)

Chair: Zhang, Jun University of Nevada Reno

Co-Chair: Powell, Kody University of Utah

10:00-10:03 WeA04.1

Transformer Neural Networks with Spatiotemporal Attention for Predictive Control and Optimization of Industrial Processes, pp. 382-387.

Gallup, Ethan; Tuttle, Jacob; Immonen, Jake; Billings, Blake; Powell, Kody

10:03-10:06 WeA04.2

A Transition System Abstraction Framework for Neural Network Dynamical System Models, pp. 388-393.

Yang, Yejiang; Mo, Zihao; Tran, Hoang-Dung; Xiang, Weiming

10:06-10:09 WeA04.3

A Data-Driven Method for Safety-Critical Control: Designing Control Barrier Functions from State Constraints, pp. 394-401.

Lee, Jaemin; Kim, Jeeseop; Ames, Aaron D.

10:09-10:12 WeA04.4

Physics-Data-Hybrid Modeling of Tilt-Rotor Vertical Take-Off and Landing Aircraft, pp. 402-407.

Burton, Samantha; He, Tianyi; Su, Weihua

10:12-10:15 WeA04.5

Disturbance Propagation in Vehicle Platoons: Symmetric Bidirectional Interconnections, pp. 408-413.

Farnam, Arash; Farsi, Milad; Ghorbani, Majid; L. Azad, Nasser; Crevecoeur, Guillaume

10:15-10:18 WeA04.6

Physically Motivated Heater Model for Precise Gas Temperature Control in Fuel Cell Stack Test Beds, pp. 414-420.

Zeiringer, Thomas; Seeber, Richard; Horn, Martin

10:18-10:21 WeA04.7

Dynamic Modeling and Stability Analysis of Balancing in Riderless Electric Scooters, pp. 421-426.

Lin, Yun-Hao; Jafari, Alireza; Liu, Yen-Chen

10:21-10:24 WeA04.8

Identification of Multirotor Actuator Dynamics with RPM Feedback for Improved Control, pp. 427-432.

Charla, Sesha; Yao, Bin; Voyles, Richard

10:24-10:27 WeA04.9

Spreading Dynamics of an SIQRS Epidemic Model and Quarantine Strategy Analysis, pp. 433-438.

Wang, Ruiyang; Wang, Siqing; Mei, Wenjun

10:27-10:30 WeA04.10

Dimensionality Reduction of Dynamics on Lie Groups Via Structure-Aware Canonical Correlation Analysis, pp. 439-446.

Chung, Wooyoung; Polani, Daniel; Tiomkin, Stas

10:30-10:33 WeA04.11

Moving past Point-Contacts: Extending the ALIP Model to Humanoids with Non-Trivial Feet Using Hierarchical, Full-Body Momentum Control, pp. 447-453.

Paredes, Victor; Hagen, Daniel; Chesebrough, Samuel; Swann, Riley; Garagic, Denis; Hereid, Ayonga

10:33-10:36 WeA04.12

Exact Consistency Tests for Gaussian Mixture Filters Using Normalized Deviation Squared Statistics, pp. 454-461.

Ahmed, Nisar; Burks, Luke; Cabral, Kailah; Rose, Alyssa

10:36-10:39 WeA04.13

DiProber: Estimating Relays Capacities in Underloaded Anonymous Communication Networks, pp. 462-467.

Darir, Hussein; Dullerud, Geir E.; Borisov, Nikita

10:39-10:42 WeA04.14

Optimal State Estimation in the Presence of Non-Gaussian Uncertainty Via Wasserstein Distance Minimization, pp. 468-473.

Prabhat, Himanshu; Bhattacharya, Raktim

10:42-10:45 WeA04.15

Adaptive Health Monitoring of Second-Life Batteries, pp. 474-479.

Cui, Xiaofan; Khan, Muhammad Aadil; Singh, Surinder; Sharma, Ratnesh; Onori, Simona

10:45-10:48 WeA04.16

Simultaneous Parameter Estimation in Model-Free Control, pp. 480-485.

Waleed, Danial; Duffaut Espinosa, Luis Augusto

10:48-10:51 WeA04.17

Deep Reinforcement Learning Based Distributed Active Joint Localization and Target Tracking, pp. 486-491.

Wang, Dongming; Su, Shaoshu; Ren, Wei; Hao, Ce

10:51-10:54 WeA04.18

Observable GNSS-IMU Sliding Window Filtering Using Differential Flatness, pp. 492-497.

Johnson, Jacob Collin; Beard, Randal W.

10:54-10:57 WeA04.19

Sloppiness of Structured Systems with a Matrix Fraction Description, pp. 498-503.

Ma, Yunxiang; Zhou, Tong

WeB01 Metro E/C

Machine Learning I (Regular Session)

Chair: Shakeri, Heman — University of Virginia

Co-Chair: Kamalapurkar, Rushikesh — Oklahoma State University

13:30-13:45 WeB01.1

Dynamic Mode Decomposition of Control-Affine Nonlinear Systems Using Discrete Control Liouville Operators, pp. 504-509.

Morrison, Zachary; Abudia, Moad; Rosenfeld, Joel A.; Kamalapurkar, Rushikesh

13:45-14:00 WeB01.2

Enhanced Joint Angle Estimation Using Support Vector Machine-Long Short-Term Memory Fusion with Electromyography Signals, pp. 510-515.

Wahid, MD Ferdous; Tafreshi, Reza

14:00-14:15 WeB01.3

Operator-Based Detecting, Learning, and Stabilizing Unstable Periodic Orbits of Chaotic Attractors, pp. 516-521.

Tavasoli, Ali; Shakeri, Heman

14:15-14:30 WeB01.4

Counterfactually-Guided Causal Reinforcement Learning with Reward Machines, pp. 522-527.

Baharisangari, Nasim; Paliwal, Yash; Xu, Zhe

14:30-14:45 WeB01.5

Machine Learning Modeling of Nonlinear Processes with Lyapunov Stability Guarantees, pp. 528-535.

Tan, Wallace; Xiao, Ming; Wu, Guoquan; Wu, Zhe

14:45-15:00 WeB01.6

A Q-Learning Approach for Adherence-Aware Recommendations, pp. 536-541.

Faros, Ioannis; Dave, Aditya Deepak; Malikopoulos, Andreas A.

WeB02 Harbour

Network Control Systems I (Regular Session)

Chair: Mousavi, Shima Sadat — ETH Zurich

Co-Chair: Takaba, Kiyotsugu — Ritsumeikan University

13:30-13:45 WeB02.1

Event-Triggered Distributed Control of Multiagent Systems: A Performance Recovery Consideration, pp. 542-547.

Kurtoglu, Deniz; Yucelen, Tansel; Tran,

Dzung; Casbeer, David W.; Garcia, Eloy

13:45-14:00 WeB02.2

Multi-Agent Target Position Estimation Using Bearing-Only Measurements Via Spatial Excitation, pp. 548-553.

Hyeon, Soojeong; Shames, Iman; Shim, Hyungbo

14:00-14:15 WeB02.3

Strong Structural Controllability of Linear Descriptor Systems, pp. 554-559.

Mousavi, Shima Sadat; Bahrami, Somayyeh; Fekih, Afef

14:15-14:30 WeB02.4

Cooperative Learning with Gaussian Processes for Euler-Lagrange Systems Tracking Control under Switching Topologies, pp. 560-567.

Yang, Zewen; Dong, Songbo; Lederer, Armin; Dai, Xiaobing; Chen, Siyu; Sosnowski, Stefan; Hattab, Georges; Hirche, Sandra

14:30-14:45 WeB02.5

Cloud-Mediated Self-Triggered Synchronization of Physically Coupled Linear Agents, pp. 568-573.

Namba, Takumi; Takaba, Kiyotsugu

WeB03 Frontenac

Autonomous Robots I (Regular Session)

Chair: P. Vinod, Abraham — Mitsubishi Electric Research Laboratories

Co-Chair: Afghah, Fatemeh — Clemson University

13:30-13:45 WeB03.1

Safety-Critical Control with Uncertainty Quantification Using Adaptive Conformal Prediction, pp. 574-580.

Zhou, Hao; Zhang, Yanze; Luo, Wenhao

13:45-14:00 WeB03.2

Cascaded Nonlinear Control Design for Highly Underactuated Balance Robots, pp. 581-586.

Han, Feng; Yi, Jingang

14:00-14:15 WeB03.3

Decoupled Trajectory Planning for Monitoring UAVs and Their UGV Carrier by Reachable Sets, pp. 587-593.

Kim, Taewan; P. Vinod, Abraham; Di Cairano, Stefano

14:15-14:30 WeB03.4

Probabilistic Visibility-Aware Trajectory Planning for Target Tracking in Cluttered Environments, pp. 594-600.

Gao, Han; Wu, Pengying; Su, Yao; Zhou, Kangjie; Ma, Ji; Liu, Hangxin; Liu, Chang

14:30-14:45 WeB03.5

PyroTrack: Belief-Based Deep Reinforcement Learning Path Planning for Aerial Wildfire Monitoring in Partially Observable Environments, pp. 601-607.

Khoshdel, Sahand; Luo, Qi; Afghah, Fatemeh

14:45-15:00 WeB03.6

Collision-Free Platooning of Mobile Robots through a Set-Theoretic Predictive Control Approach, pp. 608-613.

Rajkumar, Suryaprakash; Tiriolo, Cristian; Lucia, Walter

WeB04 Metro W

Estimation and Identification I (Regular Session)

Chair: Ifqir, Sara — CRIStAL Laboratory, Centrale Lille Institut

Co-Chair: Khosravi, Mohammad — Delft University of Technology

13:30-13:45 WeB04.1

A New Switched Interval Observer Design for Vehicle Lateral Dynamics Estimation, pp. 614-619.

Ifqir, Sara; Ichalal, Dalil; Ait Oufroukh, Naima; Mammar, Said

13:45-14:00 WeB04.2

Closed-Form Information-Theoretic Roughness Measures for Mixture Densities, pp. 620-625.

Hanebeck, Uwe D.; Frisch, Daniel; Prossel, Dominik

14:00-14:15 WeB04.3

Linear Time-Varying Parameter Estimation: Maximum a Posteriori Approach Via Semidefinite Programming, pp. 626-631.

Vakili, Sasan; Khosravi, Mohammad; Mohajerin Esfahani, Peyman; Mazo Jr.,

Manuel

14:15-14:30 WeB04.4

MARG Sensor-Based Attitude Estimation on SO(3) under Unknown External Acceleration, pp. 632-637.

Shaaban, Ghadeer; Fourati, Hassen; Kibangou, Alain; Prieur, Christophe

14:30-14:45 WeB04.5

Distributed Fact Checking: Learning Unreliability, pp. 638-643.

Verma, Ashwin; Mohajer, Soheil; Touri, Behrouz

14:45-15:00 WeB04.6

Domain-Adaptation with Knowledge Accumulation through Parallel Stacked Autoencoders: Methodology and Application to Sulfur Recovery, pp. 644-649.

Mou, Tianhao; Liu, Jinfeng; Zou, Yuanyuan; Li, Shaoyuan; Xibilia, Maria Gabriella

WeB05 Pier 2

Optimization I (Regular Session)

Chair: Poveda, Jorge I.	University of California, San Diego
Co-Chair: Dong, Roy	University of Illinois at Urbana-Champaign

13:30-13:45 WeB05.1

Tradeoffs between Convergence Speed and Noise Amplification in First-Order Optimization: The Role of Averaging, pp. 650-655.

Samuelson, Samantha; Jovanovic, Mihailo R.

13:45-14:00 WeB05.2

Online Linear Quadratic Tracking with Regret Guarantees, pp. 656-661.

Karapetyan, Aren; Bolliger, Diego; Tsiamis, Anastasios; Balta, Efe C.; Lygeros, John

14:00-14:15 WeB05.3

An Interconnected Systems Approach to Convergence Analysis of Discrete-Time Primal-Dual Algorithms, pp. 662-668.

Kelly, Spencer; Simpson-Porco, John W.

14:15-14:30 WeB05.4

On Distributed Nonconvex Optimisation Via Modified ADMM, pp. 669-674.

Mafakheri, Behnam; Manton, Jonathan H.; Shames, Iman

14:30-14:45 WeB05.5

Connection of Optimal Stopping Time to S-T Cut Problems on Trees, pp. 675-680.

Wang, Yijin; Ornik, Melkior; Dong, Roy

14:45-15:00 WeB05.6

Decentralized Laplacian Gradient Flows with Vanishing Anchors for Resource Allocation Problems with Arbitrary Initialization, pp. 681-686.

Barreiro-Gomez, Julian; Poveda, Jorge I.

WeB06 Queens Quay 1

Control of Large-Scale Battery Energy Storage Systems (Invited Session)

Chair: Lin, Xinfan	University of California, Davis
Co-Chair: Soudbakhsh, Damoon	Temple University
Organizer: Zhang, Dong	University of Oklahoma
Organizer: Soudbakhsh, 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, Ziyou	University of Michigan, Ann Arbor
Organizer: Fogelquist, Jackson	University of California, Davis

13:30-13:45 WeB06.1

Optimal Power Management of Battery

Energy Storage Systems Via Ensemble Kalman Inversion (I), pp. 687-694.

Farakhor, Amir; Askari, Iman; Wu, Di; Fang, Huazhen

13:45-14:00 WeB06.2

Optimal Charging with Active Thermal Management for eVTOL Aircraft Battery Packs (I), pp. 695-700.

Goshtasbi, Alireza; Han, Sangwoo; Zhao, Ruxiu; Neubauer, Jeremy

14:00-14:15 WeB06.3

Depreciation Cost Is a Poor Proxy for Revenue Lost to Aging in Grid Storage Optimization (I), pp. 701-706.

Kumtepeli, Volkan; Hesse, Holger; Morstyn, Thomas; Nosratabadi, Seyyed Mostafa; Aunedi, Marko; Howey, David A.

14:15-14:30 WeB06.4

Optimal Sizing, Operation, and Efficiency Evaluation of Battery Swapping Station for Electric Heavy-Duty Trucks (I), pp. 707-712.

Wang, Ruiting; Ju, Yi; Allybokus, Zaid; Zeng, Wente; Obrecht, Nicolas; Moura, Scott

14:30-14:45 WeB06.5

Comparison between Battery Cell Level Dynamics and Pack Level Dynamics Using Equivalent Circuit Models (I), pp. 713-718.

Ross, Joseph Peter; Frost, Damien Francis; Chatzinikolaou, Efstratios; Duncan, Stephen; Howey, David A.

WeB07 Queens Quay 2

Safety of Advanced Driver Assistance Systems and Automated Driving Systems (Invited Session)

Chair: Rastgoftar, Hossein	University of Arizona
Co-Chair: Nazari, Shima	UC Davis
Organizer: Zhao, Junfeng	Arizona State University
Organizer: Rastgoftar, Hossein	University of Arizona
Organizer: Nazari, Shima	UC Davis

13:30-13:45 WeB07.1

Energy-Critical Control Using Control Barrier Functions (I), pp. 719-724.

Alan, Anil; Ivanco, Andrej; Orosz, Gabor

13:45-14:00 WeB07.2

Safety-Guaranteed Learning-Based Flocking Control Design (I), pp. 725-730.

Liu, Mingzhe; Chen, Yan

14:00-14:15 WeB07.3

Adaptive Control of Vehicle Steering-By-Wire System with Varying-Degree Lyapunov Function and Deterministic Robust Control Augmentation (I), pp. 731-736.

Zhou, Xingyu; Ahn, Hyunjin; Kung, Yung-Chi; Shen, Heran; Wang, Junmin

14:15-14:30 WeB07.4

Teleoperated Steering Using Estimated Position and Orientation of Remote Ego Vehicle (I), pp. 737-742.

Sharma, Gaurav; Rajamani, Rajesh

14:30-14:45 WeB07.5

Safety-Critical Stabilization of Mixed Traffic by Pairs of CAVs (I), pp. 743-748.

Zhao, Chenguang; Molnar, Tamas G.; Yu, Huan

WeB08 Bay

Advanced Methods in Diagnostics and Prognostics (Tutorial Session)

Chair: Castillo, Ivan	The Dow Chemical Company
Co-Chair: Wang, Zhenyu	Dow Chemical
Organizer: Castillo, Ivan	The Dow Chemical Company
Organizer: Wang, Zhenyu	Dow Chemical
Organizer: Makki, Imad	Ford Motor Company

13:30-14:15 WeB08.1

Advanced Methods in Diagnostics and Prognostics (I), pp. 749-762.

Mohr, Fabian; Sun, Weike; Braatz, Richard D.

14:15-14:30 WeB08.2

Cycle Life Prediction for Lithium-Ion Batteries: Machine Learning and More (I), pp. 763-768.

Schaeffer, Joachim; Galuppini, Giacomo;

Rhyu, Jinwook; Asinger, Patrick; Droop, Robin; Findeisen, Rolf; Braatz, Richard D.

14:30-14:45 WeB08.3

Prognostics for Chemical Processes (I), pp. 769-769.

Castillo, Ivan; Wang, Zhenyu; Chiang, Leo

14:45-15:00 WeB08.4

Predictive Analytics for Chemical Processes (I), pp. 770-770.

Paulson, Joel

WeB09 Dockside 1

Aerospace Systems (Regular Session)

Chair: Castillo, Pedro — Univ De Technologie De Compiegne

Co-Chair: Kumar, Shashi Ranjan — Indian Institute of Technology Bombay

13:30-13:45 WeB09.1

A Comparative Study of Machine Learning Techniques for Aircraft Loss of Control Prediction, pp. 771-777.

Khatri, Amit; Subbarao, Kamesh

13:45-14:00 WeB09.2

Optimal Impact Angle Guidance Via First-Order Optimization under Nonconvex Constraints, pp. 778-784.

Park, Gyubin; Choi, Jiwoo; Jeong, Da Hoon; Kim, Jong-Han

14:00-14:15 WeB09.3

Trajectory Tracking for Aerobatics Maneuvers in Quadrotors Vehicles, pp. 785-790.

Ibarra, Efrain; Castillo, Pedro

14:15-14:30 WeB09.4

Capturing a Non-Cooperative Resident Space Object: A Control Barrier Function Approach, pp. 791-796.

Edwards, Sage; Isaly, Axton; Brewer, John Matthew; Dixon, Warren E.

14:30-14:45 WeB09.5

Spiral-Based Guidance Strategy for Interception of Stationary Targets, pp. 797-802.

Mishra, Kushagra; Mukherjee, Dwaipayan; Kumar, Shashi Ranjan

14:45-15:00 WeB09.6

Three-Dimensional Nonlinear Impact Time Guidance Considering Field-Of-View Constraints, pp. 803-808.

Majumder, Kakoli; Kumar, Shashi Ranjan

WeB10 Dockside 2

Control of Cyber-Physical Systems: Multidisciplinary Approaches in Robotics, Autonomy, Optimization, and Safety (Invited Session)

Chair: Sinha, Abhinav — The University of Cincinnati

Co-Chair: Cao, Yongcan — University of Texas, San Antonio

Organizer: Sinha, Abhinav — The University of Cincinnati

Organizer: Cao, Yongcan — University of Texas, San Antonio

Organizer: Casbeer, David W. — Air Force Research Laboratory

13:30-13:45 WeB10.1

Path Integral Control with Rollout Clustering and Dynamic Obstacles (I), pp. 809-814.

Patrick, Steven; Bakolas, Efstathios

13:45-14:00 WeB10.2

State-Constrained Adaptive Guidance for Three-Body Pursuit-Evasion Using Super Twisting Algorithm (I), pp. 815-820.

Gurjar, Bhagyashri; Kumar, Shashi Ranjan; Mukherjee, Dwaipayan

14:00-14:15 WeB10.3

LQ-OCP: Energy-Optimal Control for LQ Problems (I), pp. 821-826.

Beaver, Logan E.

14:15-14:30 WeB10.4

Semi-Autonomous Full 3D Robot Operation with Variable Autonomy through Gaussian Process Regression (I), pp. 827-832.

Kitashiba, Atsushi; Oda, Ryo; Hatanaka, Takeshi

14:30-14:45 WeB10.5

Multi Agent Pathfinding for Noise Restricted Hybrid Fuel Unmanned Aerial Vehicles (I), pp. 833-838.

Scott, Drew; Manyam, Satyanarayana Gupta; Casbeer, David W.; Kumar, Manish; Weintraub, Isaac

14:45-15:00 WeB10.6

Resilient Fleet Management for Energy-Aware Intra-Factory Logistics (I), pp. 839-844.

Goutham, Mithun; Stockar, Stephanie

WeB11 Dockside 3

Game Theory I (Regular Session)

Chair: Ramazi, Pouria — Brock University

Co-Chair: Brown, Philip N. — University of Colorado Colorado Springs

13:30-14:15 WeB11.1

Topology of Nash Equilibrium Set with Quadratic Vector Payoff Functions, pp. 845-850.

Guo, Zehui; Hayakawa, Tomohisa

14:15-15:00 WeB11.2

From Discrete to Continuous Best-Response Dynamics: Discrete Fluctuations Do Not Scale with Population Size, pp. 851-856.

Aghaeeyan, Azadeh; Ramazi, Pouria

14:15-15:00 WeB11.3

On the Intrinsic Fragility of the Price of Anarchy, pp. 857-862.

Seaton, Joshua; Brown, Philip N.

14:15-15:00 WeB11.4

A Robust Distributed Nash Equilibrium Seeking Algorithm for Aggregative Games under Byzantine Attacks, pp. 863-868.

Zhao, Jishu; Yi, Peng

14:15-15:00 WeB11.5

Large-Scale Multi-Agent System Optimization with Fixed Final Density Constraints: An Imbalanced Mean-Field Game Theory, pp. 869-874.

Dey, Shawon; Xu, Hao

14:15-15:00 WeB11.6

On the Optimal Cost and Asymptotic Stability in Two-Player Zero-Sum Set-Valued Hybrid Games, pp. 875-880.

J. Leudo, Santiago; Ferrante, Francesco; Sanfelice, Ricardo G.

WeB12 Dockside 9

Predictive Control for Nonlinear Systems I (Regular Session)

Chair: Huan, Xun — University of Michigan

Co-Chair: Shi, Yang — University of Victoria

13:30-13:45 WeB12.1

Eco-Driving for Connected and Automated Vehicles in Mixed Traffic Urban Environments with Signalized Intersections, pp. 881-886.

Ebrahimi, Alireza; Mosharafian, Sahand; Mohammadpour Velni, Javad

13:45-14:00 WeB12.2

Data-Driven Model Predictive Control of a Nonlinear Ball-On-A-Wheel System, pp. 887-892.

Kruse, Niklas; Wache, Alexander; Aschemann, Harald; Starke, Jens

14:00-14:15 WeB12.3

Deep Koopman-Based Control of Quality Variation in Multistage Manufacturing Systems, pp. 893-898.

Chen, Zhiyi; Maske, Harshal; Upadhyay, Devesh; Shui, Huanyi; Huan, Xun; Ni, Jun

14:15-14:30 WeB12.4

Training and Generalization Errors for Underparameterized Neural Networks, pp. 899-904.

Martin Xavier, Daniel; Chamoin, Ludovic; Fribourg, Laurent

14:30-14:45 WeB12.5

Tube MPC-Based Tracking Control of AUVs Using Contraction Metric, pp. 905-910.

Zhang, Kunwu; Shi, Yang

14:45-15:00 WeB12.6

Learning-Based Distributed Model Predictive Control with State-Dependent Uncertainty Using Neural Network, pp. 911-918.

Tong, Junbo; Du, Shuhan; Fan, Wenhui

WeB13 Richmond

Constrained Control I (Regular Session)

Chair: Liu, Changliu — Carnegie Mellon University

Co-Chair: Danielson, Claus — University of New Mexico

13:30-13:45 WeB13.1

Composing Control Barrier Functions for Complex Safety Specifications, pp. 919-924.

Molnar, Tamas G.; Ames, Aaron D.

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

14:15-14:30 WeB13.4

Safety Index Synthesis with State-Dependent Control Space, pp. 937-942.

Chen, Rui; Zhao, Weiye; Liu, Changliu

14:30-14:45 WeB13.5

Constraint Admissible Positive Invariant Sets for Vehicles in SE(3), pp. 943-948.

Danielson, Claus; Brandt, Teo

14:45-15:00 WeB13.6

Safe Whole-Body Task Space Control for Humanoid Robots, pp. 949-956.

Paredes, Victor; Hereid, Ayonga

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

Morphological Computation by Exploiting Partial Feedback Linearizable Underactuated Soft-Bodied Systems (I), pp. 963-968.

Haghshenas-Jaryani, Mahdi

14:00-14:15 WeB14.3

Modeling and Control of Dielectric Actuator Enabled Prosthetic Finger (I), pp. 969-974.

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; Zhang, 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, Yury

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

14:00-14:15 WeB15.3

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

Hasanzadeh, Milad; Tang, Shuxia

14:15-14:30 WeB15.4

Predictor-Based Prescribed-Time Output Feedback for a Parabolic PDE (I), pp. 1006-1011.

Zekraoui, Salim; Espitia, Nicolas; Perruquetti, Wilfrid; Krstic, Miroslav

14:30-14:45 WeB15.5

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

WeB16 Dockside 4

Wind Turbines and Wind Farms (Invited Session)

Chair: Sinner, Michael	National Renewable Energy Laboratory
Co-Chair: Mulders, Sebastiaan Paul	Delft University of Technology
Organizer: Mulders, Sebastiaan Paul	Delft University of Technology
Organizer: Sinner, Michael	National Renewable Energy Laboratory
Organizer: Bay, Christopher	National Renewable Energy Laboratory
Organizer: Fleming, Paul	National Renewable Energy Laboratory
Organizer: van Wingerden, Jan-Willem	Delft University of Technology

13:30-13:45 WeB16.1

Short-Term Wind Forecasting Using Surface Pressure Measurements (I), pp. 1024-1029.

Abootorabi, Seyedalireza; Leonardi, 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

14:00-14:15 WeB16.3

Voltage Restoration in MVDC Shipboard Microgrids with Economic Nonlinear Model Predictive Control (I), pp. 1038-1043.

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

14:30-14:45 WeB16.5

H Infinity Phase Locking Control for Wave Induced Wake Mixing (I), pp. 1051-1056.

van den Berg, Daniel; De Tavernier, Delphine; van Wingerden, Jan-Willem

14:45-15:00 WeB16.6

Self-Learning Data-Driven Wind Farm Control Strategy Using Field Measurements (I), pp. 1057-1064.

Hulsman, Paul; Howland, Michael; Göçmen, Tuhfe; Petrovi , Vlaho; Kühn, Martin

WeB17 Dockside 5

Cooperative Control (Regular Session)

Chair: Chen, Lijun	University of Colorado at Boulder
Co-Chair: Liu, Junwei	Southern University of Science and Technology

13:30-13:45 WeB17.1

Fully Distributed Consensus of Multi-Agent Systems with Improved Minimum Inter-Event Times, pp. 1065-1070.

Su, Ruchao; Li, Xianwei; Li, Shaoyuan

13:45-14:00 WeB17.2

Dynamic Event-Triggered Control for Multi-Agent Consensus with Relative Output Feedback, pp. 1071-1076.

Zhan, Sikang; Li, Xianwei

14:00-14:15 WeB17.3

Unbounded Cooperative Pursuit Using a Linearized Safe-Reachable Set, pp. 1077-1082.

Ouyang, Zikai; Liu, Junwei; Lu, Haibo; Zhang, Wei

14:15-14:30 WeB17.4

ROMA-iQSS: An Objective Alignment Approach Via State-Based Value Learning and ROund-Robin MultiAgent Scheduling, pp. 1083-1090.

Lin, Chi-Hui; Koh, Joewie J.; Roncone, Alessandro; Chen, Lijun

14:30-14:45 WeB17.5

MR.CAP: Multi-Robot Joint Control and Planning for Object Transport, pp. 1091-1096.

Jaafar, Hussein Ali; Kao, Cheng-Hao; Saeedi, Sajad

14:45-15:00 WeB17.6

Distributed Dual-Layer Adaptive Event-Triggered Formation Tracking for Quadrotor UAVs, pp. 1097-1102.

Chen, Tianxing; Zhang, Hongwei

WeB18 Dockside 6

Stability of Linear Systems (Regular Session)

Chair: Yedavalli, Rama K. — Ohio State Univ

Co-Chair: Ito, Hiroshi — Kyushu Institute of Technology

13:30-13:45 WeB18.1

Convex Stability of Interconnections-Free X Shaped Real Square Matrices: New Conditions Using Transformation Allergic Indices and Proper X^{0} Definition, pp. 1103-1108.

Yedavalli, Rama K.

13:45-14:00 WeB18.2

Transformation Allergic Index Singularity: A Hidden Premature Instability Unrecognizable by Hurwitz Stable Matrices with Serious Implications to Safety Critical Systems, pp. 1109-1114.

Yedavalli, Rama K.

14:00-14:15 WeB18.3

Distributed Stability Conditions for Interconnected LTI Systems Based on Differential Interconnection Neutral Functions, pp. 1115-1120.

Kristovi , Pietro; Jokic, Andrej

14:15-14:30 WeB18.4

Stabilization of Almost Periodic Piecewise Linear Systems with Norm-Bounded Uncertainty for Roll-To-Roll Dry Transfer Manufacturing Processes, pp. 1121-1126.

Martin, Christopher; Li, Wei; Chen, Dongmei

14:30-14:45 WeB18.5

A Dissipativity Framework for Input-To-State Stability with Positivity of Dynamical Systems with Interior Equilibria, pp. 1127-1132.

Ito, Hiroshi

14:45-15:00 WeB18.6

Hybrid Feedback Control for Global and Optimal Safe Navigation, pp. 1133-1138.

Cheniouni, Ishak; Berkane, Soulaimane; Tayebi, Abdelhamid

WeB19 Pier 7

Robust Control I (Regular Session)

Chair: Ratnam, Elizabeth — The Australian National University

Co-Chair: Liu, Jun — University of Waterloo

13:30-13:45 WeB19.1

Robust Model Predictive Control for Networked Control Systems with Timing Perturbations, pp. 1139-1145.

Wang, Renke; Yao, Ningshi

13:45-14:00 WeB19.2

Data-Driven Superstabilization of Linear Systems under Quantization, pp. 1146-1151.

Miller, Jared; Zheng, Jian; Sznaier, Mario; Hixenbaugh, Chris

14:00-14:15 WeB19.3

Achieving Optimal Performance with Data-Driven Frequency-Based Control Synthesis Methods, pp. 1152-1157.

Schuchert, Philippe; Karimi, Alireza

14:15-14:30 WeB19.4

Design and Stability of Angle Based Feedback Control in Power Systems: A Negative-Imaginary Approach, pp. 1158-1163.

Chen, Yijun; Petersen, Ian R.; Ratnam, Elizabeth

14:30-14:45 WeB19.5

Distributionally Robust Path Integral Control, pp. 1164-1171.

Park, Hyuk; Zhou, Duo; Hanasusanto, Grani A.; Tanaka, Takashi

14:45-15:00 WeB19.6

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

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

WeB20 Pier 8

Kalman Filtering (Regular Session)

Chair: Molloy, Timothy L. — Australian National University

Co-Chair: Chen, Tongwen — University of Alberta

13:30-13:45 WeB20.1

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

Guo, Ziyi; Zhou, Jing; Chen, Tongwen

13:45-14:00 WeB20.2

State and Parameter Estimation of Non-Ideal Batch Reactors with Heel Masses, pp. 1186-1191.

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

14:00-14:15 WeB20.3

A Novel Variational Bayesian Adaptive Kalman Filter for Systems with Unknown State-Dependent Noise Covariance Matrices, pp. 1192-1197.

Uzzaman, Nahid; Bai, He

14:15-14:30 WeB20.4

Computationally Efficient Implementation of the Weighted Kalman Filter for Quadratic Systems, pp. 1198-1203.

Rotondo, Damiano; Witczak, Marcin; Seybold, Lothar

14:30-14:45 WeB20.5

Two-Channel Extended Kalman Filtering with Intermittent Measurements, pp. 1204-1211.

Maer, Vicu-Mihalis; Lendek, Zsofia; Pirje, Stefan; Tolic, Domagoj; Đuraš, Antun; Prka in, Vicko; Palunko, Ivana; Busoniu, Lucian

14:45-15:00 WeB20.6

Extended Kalman Filtering for Recursive Online Discrete-Time Inverse Optimal Control, pp. 1212-1218.

Zhao, Tian; Molloy, Timothy L.

WeB21 Pier 3

Linear Systems (Regular Session)

Chair: Drummond, Ross — University of Sheffield

Co-Chair: Jokic, Andrej — University of Zagreb

13:30-13:45 WeB21.1

Data-Driven State-Feedback Controller Synthesis for Dissipativity: A Dualization-Based Approach, pp. 1219-1224.

Kristovi , Pietro; Jokic, Andrej

13:45-14:00 WeB21.2

Formula for Estimating the Frequency Response of LTI Systems from Noisy Finite-Length Datasets, pp. 1225-1230.

Ossareh, Hamid; Dörfler, Florian

14:00-14:15 WeB21.3

Externally Positive Linear Systems from Transfer Function Properties, pp. 1231-1236.

Drummond, Ross; Turner, Matthew C.

14:15-14:30 WeB21.4

Can Model-Free Controllers for Complex Systems Stabilize and Provide Satisfactory Response?, pp. 1237-1242.

Narendra, Kumpati S.; George, Koshy

14:30-14:45 WeB21.5

On Formalisation of Martin Distance for Linear Dynamical Systems, pp. 1243-1248.

Sinha, Subhrajit; Nandanoori, Sai Pushpak; Huang, Bowen; Ramachandran, Thiagarajan; Bakker, Craig

WeC01	Metro E/C
Machine Learning II (Regular Session)	
Chair: Xu, Zeyuan	National University of Singapore
Co-Chair: Jin, Ming	Virginia Tech

15:30-15:45 WeC01.1

Is Data All That Matters? the Role of Control Frequency for Learning-Based Sampled-Data Control of Uncertain Systems, pp. 1249-1255.

Römer, Ralf; Brunke, Lukas; Zhou, Siqi; Schoellig, Angela P

15:45-16:00 WeC01.2

Federated Learning-Based Distributed Model Predictive Control of Nonlinear Systems, pp. 1256-1262.

Xu, Zeyuan; Wu, Zhe

16:00-16:15 WeC01.3

Optimization Solution Functions As Deterministic Policies for Offline Reinforcement Learning, pp. 1263-1268.

Khattar, Vanshaj; Jin, Ming

16:15-16:30 WeC01.4

A Practical Reinforcement Learning (RL) Controller Design for Nonlinear Systems, pp. 1269-1274.

Hassanpour, Hesam; Mhaskar, Prashant; Corbett, Brandon

16:30-16:45 WeC01.5

Promises of Deep Kernel Learning for Control Synthesis, pp. 1275-1280.

Reed, Robert; Laurenti, Luca; Lahijanian, Morteza

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

Nonminimum Phase Zeros Effect on the Signal-To-Noise Ratio Channel Input Constraint in Continuous Time, pp. 1281-1286.

Rojas, Alejandro J.

15:45-16:00 WeC02.2

Multi-Event-Triggered Control with Reduced Packet Sizes for Quantized Discrete-Time Linear Systems, pp. 1287-1292.

Batmani, Yazdan; Karimi, Zahra; Davoodi, Mohammadreza

16:00-16:15 WeC02.3

Risk Assessment of Multi-Agent System under Denial-Of-Service Cyberattacks Using Reachable Set Synthesis, pp. 1293-1298.

Cho, Minhyun; Hwang, Sounghwan; Hwang, Inseok

16:15-16:30 WeC02.4

Second-Order Heterogeneous Multi-Agent Target Tracking without Relative Velocities, pp. 1299-1304.

Nino, Cristian F.; Patil, Omkar Sudhir; Dixon, Warren E.

16:30-16:45 WeC02.5

Output-Feedback Stabilization of Stochastically-Sampled Networked Control System under Packet Dropouts, pp. 1305-1310.

Basu, Himadri; Fiacchini, Mirko; Ferrante, Francesco; Gomes da Silva Jr, Joao Manoel

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

Optimal Path Planning of a Solar-Powered Unmanned Ground Vehicle in an Unknown Solar Environment with Multi-Objective Optimization, pp. 1311-1316.

Strebe, Luke; Lee, Kooktae

15:45-16:00 WeC03.2

Cooperative 3-D Active Multi-Robot Multi-Target Tracking, pp. 1317-1322.

Xu, Jie; Zhu, Pengxiang; Ren, Wei

16:00-16:15 WeC03.3

Energy Optimal Obstacle Avoidance Motion Planning for Wheeled Mobile Robots, pp. 1323-1328.

Kim, Youngjin; Singh, Tarunraj

16:15-16:30 WeC03.4

Motion Planning for Autonomous Vehicles: When Model Predictive Control Meets Ensemble Kalman Smoothing, pp. 1329-1334.

Askari, Iman; Wang, Yebin; Deshpande, Vedang M.; Fang, Huazhen

16:30-16:45 WeC03.5

A Comparison between Lie Group and Lie Algebra Based Potential Functions for Geometric Impedance Control, pp. 1335-1342.

Seo, Joohwan; Potu Surya Prakash, Nikhil; Choi, Jongeun; Horowitz, Roberto

16:45-17:00 WeC03.6

Local-Global Interval MDPs for Efficient Motion Planning with Learnable Uncertainty, pp. 1343-1349.

Jiang, Jesse; Zhao, Ye; Coogan, Samuel

WeC04 Metro W

Estimation and Identification II (Regular Session)

Chair: Anderson, Logan — University of Minnesota

Co-Chair: Arezki, Hasni — University of Genova (Italy) University of Lorraine (France)

15:30-15:45 WeC04.1

Nonlinear Observer Design for Vehicle Lateral Load Transfer Ratio Estimation, pp. 1350-1354.

Meng, Shengya; Meng, Fanwei; Zhang, Fan; Alma, Marouane; Haddad, Madjid; Zemouche, Ali

15:45-16:00 WeC04.2

Simple but Useful Contributions to High-Gain Observer for Non-Triangular Systems, pp. 1355-1360.

Arezki, Hasni; Zemouche, Ali

16:00-16:15 WeC04.3

Controlling UAVs by Sensing the Electric or the Magnetic Field Around Power Lines, pp. 1361-1366.

Satici, Aykut C; Peterson, Alex; Chiasson, John; Adams, Zachary

16:15-16:30 WeC04.4

Two-Layer Diffusion Adaptive Filters Over Directed Markovian Switching Networks, pp. 1367-1372.

Xie, Siyu; Gan, Die; Liu, Zhixin

16:30-16:45 WeC04.5

Outlier Accommodation for GNSS Precise Point Positioning Using Risk-Averse State Estimation, pp. 1373-1379.

Hu, Wang; Uwineza, Jean-Bernard; Farrell, Jay A.

16:45-17:00 WeC04.6

Statistical Bounds on Identified QSR Dissipative Properties from Input-Output Data, pp. 1380-1385.

Anderson, Logan; Caverly, Ryan James; Lamperski, Andrew

WeC05 Pier 2

Optimization II (Regular Session)

Chair: Chen, Xu — University of Washington

Co-Chair: Oliveira, Tiago Roux — State University of Rio De Janeiro

15:30-15:45 WeC05.1

Extremum Seeking for a Class of Wave Partial Differential Equations with Kelvin-Voigt Damping, pp. 1386-1391.

Silva, Paulo Cesar Souza; Pellanda, Paulo Cesar; Oliveira, Tiago Roux; de Andrade, Gustavo Artur; Krstic, Miroslav

15:45-16:00 WeC05.2

Distributed Optimization of Network Weights for Improved Performance, pp. 1392-1397.

Xu, Yicheng; Jabbari, Faryar

16:00-16:15 WeC05.3

On-Line Motion Planning Using Bernstein Polynomials for Enhanced Target Localization in Autonomous Vehicles, pp. 1398-1403.

Tabasso, Camilla; Cichella, Venanzio

16:15-16:30 WeC05.4

Safe Online Convex Optimization with First-Order Feedback, pp. 1404-1410.

Hutchinson, Spencer; Alizadeh,

Mahnoosh

16:30-16:45 WeC05.5

Sparsity Via Sparse Group K-Max Regularization, pp. 1411-1416.

Tao, Qinghua; Xi, Xiangming; Xu, Jun; Suykens, J.A.K.

16:45-17:00 WeC05.6

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: Soudbakhsh, 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, Ziyou	University of Michigan, Ann Arbor
Organizer: Fogelquist, Jackson	University of California, Davis

15:30-15:45 WeC06.1

Bias-Compensated State Estimation Algorithm for LFP Batteries with Flat OCV-SOC Curves (I), pp. 1423-1428.

Yi, Baozhao; Zhang, Jiawei; Song, Ziyou

15:45-16:00 WeC06.2

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: Malikopoulos, 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

16:00-16:15 WeC07.3

Decentralized Optimal Merging Control for Mixed Traffic with Vehicle Inference, pp. 1468-1473.

Xiao, Wei; Cassandras, Christos G.

16:15-16:30 WeC07.4

Optimizing the Crossing Sequence in Autonomous Intersection Management with Travel Time and Energy Considerations, pp. 1474-1479.

Hadjigeorgiou, Andreas; Timotheou, Stelios

16:30-16:45 WeC07.5

Global Stabilization of Nash Equilibrium for Mixed Traffic, pp. 1480-1487.

Scruggs, Jeff; Lee, Richard; Yin, Yafeng

16:45-17:00 WeC07.6

Routing in Mixed Transportation Systems for Mobility Equity, pp. 1488-1493.

Bang, Heeseung; Dave, Aditya Deepak; Malikopoulos, Andreas A.

WeC08 Bay

Fault Diagnosis (Regular Session)

Chair: Kravaris, Costas — Texas A&M University

Co-Chair: Bollas, George — University of Connecticut

15:30-15:45 WeC08.1

Fault Identification Enhancement with Reinforcement Learning (FIERL), pp. 1494-1499.

Sartor, Davide; Zaccaria, Valentina; Del Favero, Simone; Susto, Gian Antonio

15:45-16:00 WeC08.2

Fault Detection in Closed-Loop Systems Based on Inferential Sensors, pp. 1500-1505.

Safikou, Efi; Bollas, George

16:00-16:15 WeC08.3

Dual-Stream Cross-Modal Feature Fusion Based on Multi-Scale Attention for Industrial Fault Diagnosis, pp. 1506-1511.

Lian, Penglong; Shang, Penghui; Zhang, Jiyang; Su, Zhiheng; Zou, Jianxiao; Fan, Shicai

16:15-16:30 WeC08.4

Detection of Valve Stiction in Industrial Control Loops through Continuous Wavelet Transformation with a CNN, pp. 1512-1517.

Gunnell, LaGrande; Perez, Krystian X; Castillo, Ivan; Hoogerwerf, Rob; Smith, Alexander; Peng, You; Hedengren, John

16:30-16:45 WeC08.5

Disturbance Decoupled Functional Observers for Fault Estimation in Nonlinear Systems, pp. 1518-1524.

Venkateswaran, Sunjeev; Kravaris, Costas

16:45-17:00 WeC08.6

Fully Distributed Unknown Input Observer Based Fault Detection for Interconnected Systems, pp. 1525-1530.

Liang, Dingguo; He, Zhichen; Zhao, Zhengen; Li, Wenlong; Yang, Ying

WeC09 Dockside 1

Flight Control (Regular Session)

Chair: Michieletto, Giulia — University of Padova

Co-Chair: Kidambi, Krishna Bhavithavya — University of Dayton

15:30-15:45 WeC09.1

Multi-Outer Loop Dynamic Inversion Control: An Application to a VTOL Free-Wing Aircraft, pp. 1531-1536.

Axten, Rachel; Khamvilai, Thanakorn; Johnson, Eric

15:45-16:00 WeC09.2

Multi-Agent Reinforcement Learning for the Low-Level Control of a Quadrotor UAV, pp. 1537-1542.

Yu, Beomyeol; Lee, Taeyoung

16:00-16:15 WeC09.3

Hybrid Control Framework of UAVs under Varying Wind and Payload Conditions, pp. 1543-1549.

Coursey, Austin; Zhang, Allan; Quinones-Grueiro, Marcos; Biswas, Gautam

16:15-16:30 WeC09.4

Trajectory Tracking for Tilted Hexarotors with Concurrent Attitude Regulation, pp. 1550-1555.

Perin, Marco; Bertoni, Massimiliano; Michieletto, Giulia; Oboe, Roberto; Cenedese, Angelo

16:30-16:45 WeC09.5

A Hammerstein-Weiner Modification of Adaptive Autopilot for Parameter Drift Mitigation with Experimental Results, pp. 1556-1561.

Chee, Yin Yong; Oveissi, Parham; Shao, Siyuan; Lee, Joonghyun; Paredes Salazar, Juan Augusto; Bernstein, Dennis S.; Goel, Ankit

16:45-17:00 WeC09.6

Application of a Robust Nonlinear Control Strategy for Disturbance-Resilient Tilt-Rotor Quadcopter Trajectory Tracking, pp. 1562-1567.

Ijoga, Emmanuel Ogbanje; Kidambi, Krishna Bhavithavya; MacKunis, William

WeC10 Dockside 2

Adaptive Control I (Regular Session)

Chair: Cenedese, Angelo — University of Padova

Co-Chair: Kiumarsi, Bahare — Michigan State University

15:30-15:45 WeC10.1

Data-Driven Model Predictive Control of Airfoil Flow Separation, pp. 1568-1573.

Vander Schaaf, Jacob; Lu, Qizhi; Fidkowski, Krzysztof; Bernstein, Dennis S.

15:45-16:00 WeC10.2

Safe Reinforcement Learning Based on Off-Policy Approach for Nonlinear Discrete-Time Systems, pp. 1574-1579.

Jha, Mayank Shekhar; Kiumarsi, Bahare; Theilliol, Didier

16:00-16:15 WeC10.3

Enhancing Human Operator Performance with Long Short-Term Memory Networks in Adaptively Controlled Systems, pp. 1580-1585.

Uzun, Muhammed Yusuf; Inanc, Emirhan; Yildiz, Yildiray

16:15-16:30 WeC10.4

Newton Bases and Event-Triggered Adaptive Control in Native Spaces, pp. 1586-1591.

Powell, Nathan; Kurdila, Andrew J.; Wang, Haoran; L'Afflitto, Andrea; Guo, Jia

16:30-16:45 WeC10.5

Adaptive Augmentation with Exponential Command Limiting for Aerial Vehicle Attitude Protection, pp. 1592-1597.

Sun, Donglei; Hovakimyan, Naira

16:45-17:00 WeC10.6

A Natural Indirect Adaptive Controller for a Satellite-Mounted Manipulator, pp. 1598-1603.

Giordano, Jacopo; Cenedese, Angelo; Serrani, Andrea

WeC11 Dockside 3

Game Theory II (Regular Session)

Chair: Brown, Philip N. — University of Colorado Colorado Springs

Co-Chair: Sanjari, Sina — Queen's University and Royal Military College

15:30-15:45 WeC11.1

Learning How to Strategically Disclose Information, pp. 1604-1609.

Velicheti, Raj Kiriti; Bastopcu, Melih; Etesami, Rasoul; Basar, Tamer

15:45-16:00 WeC11.2

Nash Equilibrium for Multi-Player Regime Switching Stochastic Differential Games, pp. 1610-1615.

Wang, Mingrui; Chakraborty, Prakash

16:00-16:15 WeC11.3

Large Decentralized Continuous-Time Convex Stochastic Teams and Their Mean-Field Limits, pp. 1616-1621.

Sanjari, Sina; Saldi, Naci; Yuksel, Serdar

16:15-16:30 WeC11.4

Rationality and Connectivity in Stochastic Learning for Networked Coordination Games, pp. 1622-1627.

Zhang, Yifei; Vasconcelos, Marcos M.

16:30-16:45 WeC11.5

Information Design under Uncertainty for Vehicle-To-Vehicle Communication, pp. 1628-1633.

Gould, Brendan; Brown, Philip N.

16:45-17:00 WeC11.6

Equilibrium Selection in Data Markets: Multiple-Principal, Multiple-Agent Problems with Non-Rivalrous Goods, pp. 1634-1639.

Wadhwa, Samir; Dong, Roy

WeC12 Dockside 9

Predictive Control for Nonlinear Systems II (Regular Session)

Chair: Han, Kyoungseok — Kyungpook National University

Co-Chair: Mohammadpour Velni, Javad — Clemson University

15:30-15:45 WeC12.1

Deep Neural Network NMPC for Computationally Tractable Optimal Power Management of Hybrid Electric Vehicles, pp. 1640-1645.

Park, Suyong; Nguyen, Duc Giap; Park, Jinrak; Kim, Dohee; Eo, Jeong Soo; Han, Kyoungseok

15:45-16:00 WeC12.2

Neural Horizon Model Predictive Control -- Increasing Computational Efficiency with Neural Networks, pp. 1646-1651.

Alsmeier, Hendrik; Savchenko, Anton; Findeisen, Rolf

16:00-16:15 WeC12.3

Model Predictive Control Barrier Functions: Guaranteed Safety with Reduced Conservatism and Shortened Horizon, pp. 1652-1657.

Abdi, Hossein; Zhao, Pan; Hovakimyan, Naira; Ghabcheloo, Reza

16:30-16:45 WeC12.5

Learning-Based Safety Critical Model Predictive Control Using Stochastic Control Barrier Functions, pp. 1658-1663.

Nejatbakhsh Esfahani, Hossein; Ahmadi, Sajad; Mohammadpour Velni, Javad

16:45-17:00 WeC12.6

A Heuristic for Dynamic Output Predictive Control Design for Uncertain Nonlinear Systems, pp. 1664-1669.

Alamir, Mazen

WeC13 Richmond

Constrained Control II (Regular Session)

Chair: Nicotra, Marco M — University of Colorado Boulder

Co-Chair: Richards, Christopher — University of Louisville

15:30-15:45 WeC13.1

A Constrained Tracking Controller for Ramp and Sinusoidal Reference Signals Using Robust Positive Invariance, pp. 1670-1675.

Franca dos Santos, Geovana; Castelan, Eugenio B.; Lucia, Walter

15:45-16:00 WeC13.2

Control Barrier Function for Linearizable Systems with High Relative Degrees from Signal Temporal Logics: A Reference Governor Approach, pp. 1676-1681.

Liang, Kaier; Cai, Mingyu; Vasile, Cristian Ioan

16:00-16:15 WeC13.3

A Terminal Set Feasibility Governor for Nonlinear Model Predictive Control, pp. 1682-1688.

Skibik, Terrence; Nicotra, Marco M

16:15-16:30 WeC13.4

Safe Motion Planning for Serial-Chain Robotic Manipulators Via Invariant Sets, pp. 1689-1694.

Brandt, Teo; Fierro, Rafael; Danielson, Claus

16:30-16:45 WeC13.5

Anti-Windup Compensator Design for Guidance and Control of Quadrotors, pp. 1695-1700.

Shahbazzadeh, Majid; Richards, Christopher

16:45-17:00 WeC13.6

Modelling a Broad Class of Actuator Saturations Using Takagi-Sugeno Models with a Reduced Number of Local Models, pp. 1701-1706.

Bainier, Gustave; Marx, Benoit; Ponsart, Jean-Christophe

WeC14 Wellington

Advanced Control for Safe Process Operations (Invited Session)

Chair: Durand, — Wayne State

Helen	University
Co-Chair: Tian, Yuhe	West Virginia University
Organizer: Tian, Yuhe	West Virginia University
Organizer: Durand, Helen	Wayne State University

15:30-15:45 WeC14.1

Dynamic Risk-Based Model Predictive Quality Control with Online Model Updating (I), pp. 1707-1712.

Braniff, Austin; Tian, Yuhe

15:45-16:00 WeC14.2

Synthesis of Data-Driven Nonlinear State Observers Using Lipschitz-Bounded Neural Networks (I), pp. 1713-1719.

Tang, Wentao

16:00-16:15 WeC14.3

Bootstrapped Gross Error Detection for Efficient and Fault-Tolerant Real-Time Optimization (I), pp. 1720-1725.

Patron, Gabriel David; Ricardez-Sandoval, Luis

16:15-16:30 WeC14.4

A Set-Based Control Mode Selection Approach for Active Detection of False Data Injection Cyberattacks (I), pp. 1726-1731.

Narasimhan, Shilpa; El-Farra, Nael H.; Ellis, Matthew

16:30-16:45 WeC14.5

Lyapunov-Based Model Predictive Control Using Operable Adaptive Sparse Identification of Systems (OASIS) (I), pp. 1732-1737.

Bhadriraju, Bhavana; Kwon, Joseph; Khan, Faisal

WeC15 Yonge

Estimation and Control of Distributed Parameter Systems II (Invited Session)

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

15:30-15:45 WeC15.1

Finite-Time Boundary Stabilization for LWR Traffic Flow Model (I), pp. 1738-1743.

Zhao, Hanxu; Zhan, Jingyuan; Zhang, Liguo

15:45-16:00 WeC15.2

Adaptive and Optimal Spatial PD Coupling in Synchronization Control of Networked Second-Order Infinite Dimensional Systems (I), pp. 1744-1750.

Demetriou, Michael A.

16:00-16:15 WeC15.3

Controllability and Optimal Control of Water Networks – a Comparison of Three Lumped Models (I), pp. 1751-1756.

Baumann, Henry; Schaum, Alexander; Meurer, Thomas

16:15-16:30 WeC15.4

Neural Operator Approximations of Backstepping Kernels for 2x2 Hyperbolic PDEs (I), pp. 1757-1763.

Wang, Shanshan; Diagne, Mamadou; Krstic, Miroslav

16:30-16:45 WeC15.5

Modeling and Detection of Cyber-Attacks on Highway Networks Using a 2D-LWR Model and Gaussian Processes (I), pp. 1764-1770.

Kashyap, Abhishek; Chakravarthy, Animesh; Menon, Prathyush P

16:45-17:00 WeC15.6

Distributed Biconnecitvity Achievement and Preservation in Multi-Agent Systems, pp. 1771-1776.

Restrepo, Esteban; Robuffo Giordano, Paolo

WeC16 Dockside 4

Smart Grid (Regular Session)

Chair: Barooah, Prabir	Indian Institute of Technology, Guwahati
Co-Chair: Caiazzo, Bianca	University of Naples Federico II

15:30-15:45 WeC16.1

Resilient Decentralized Control of Power Buffers in DC Microgrids, pp. 1777-1782.

Qian, Yangyang; Zhou, Siyu; Lin, Zongli;

Wan, Yan; Shamash, Yacov

15:45-16:00 WeC16.2

Prescribed-Time Consensus Control for the Voltage Restoration in Inverter-Based Islanded Microgrids, pp. 1783-1788.

Caiazzo, Bianca; Lui, Dario Giuseppe; Petrillo, Alberto; Leccese, Sara; Santini, Stefania; Andreotti, Amedeo

16:00-16:15 WeC16.3

Competitive Equilibrium in Microgrids with Dynamic Loads, pp. 1789-1794.

Salehi, Zeinab; Chen, Yijun; Petersen, Ian R.; Ratnam, Elizabeth; Shi, Guodong

16:15-16:30 WeC16.4

Comments on Characterizing Demand Flexibility to Provide Power Grid Services, pp. 1795-1800.

Barooah, Prabir

16:30-16:45 WeC16.5

Robust Microgrid Energy Management System through a Scenario Approach, pp. 1801-1806.

Del Duca, Alessandro; Ruiz, Fredy; Scattolini, Riccardo

WeC17 Dockside 5

Distributed Control I (Regular Session)

Chair: Sarsilmaz, Selahattin Burak — Utah State University

Co-Chair: Jensen, Emily — University of California, Berkeley

15:30-15:45 WeC17.1

Trade-Off between Privacy and Accuracy in Resilient Vector Consensus, pp. 1807-1812.

Liu, Bing; Zhao, Chengcheng

15:45-16:00 WeC17.2

Scalable Reinforcement Learning for Linear-Quadratic Control of Networks, pp. 1813-1818.

Olsson, Johan; Zhang, Runyu; Tegling, Emma; Li, Na

16:00-16:15 WeC17.3

Joint Design of Estimation and Control for Multi-Agent Systems with Bearing Measurements, pp. 1819-1824.

Fang, Xu; Li, Xiaolei; Xie, Lihua

16:15-16:30 WeC17.4

A Fully Distributed, Air-Ground Coordinated Coverage Control for Multi-Robot Systems with Limited Sensing Range, pp. 1825-1830.

Zhang, Hang; Zheng, Ronghao; Zhang, Senlin; Liu, Meiqin

16:30-16:45 WeC17.5

Cooperative Output Regulation with Disturbance Decoupling, pp. 1831-1836.

Sarsilmaz, Selahattin Burak; Gul, Kursad Metehan; Acikmese, Behcet

WeC18 Dockside 6

Stability of Nonlinear Systems I (Regular Session)

Chair: Liu, Xinzhi — University of Waterloo

Co-Chair: Umathe, Bhagyashree — Clemson University

15:30-15:45 WeC18.1

Global Exponential Stability or Contraction of an Unforced System Do Not Imply Entrainment to Periodic Inputs, pp. 1837-1842.

Duvall, Alon; Sontag, Eduardo

15:45-16:00 WeC18.2

Adaptive Meshes and Contraction Condition Certification for Nonlinear Control Synthesis Using Machine Learning, pp. 1843-1848.

Wei, Lai; McCloy, Ryan Josef; Bao, Jie

16:00-16:15 WeC18.3

Spectral Koopman Method for Identifying Stability Boundary, pp. 1849-1854.

Umathe, Bhagyashree; Vaidya, Umesh

16:15-16:30 WeC18.4

A Neural-Lyapunov-Based Adaptive Resilient Cruise Control of Platoons Subject to Cyber-Attacks on Leaders, pp. 1855-1860.

Khoshnevisan, Ladan; Liu, Xinzhi

16:30-16:45 WeC18.5

Dynamic Output-Feedback Switching Control for Discrete-Time LPV Switched Systems, pp. 1861-1866.

Souza, Andressa; Oliveira, Ricardo C. L. F.; Peres, Pedro L. D.

16:45-17:00 WeC18.6

Guaranteed Stabilization and Safety of

Nonlinear Systems Via Sliding Mode Control, pp. 1867-1872.

Ding, Fan; Ke, Jin; Jin, Wanxin; He, Jianping; Duan, Xiaoming

WeC19 Pier 7

Robust Control II (Regular Session)

Chair: Yong, Sze Zheng — Northeastern University

Co-Chair: Caverly, Ryan James — University of Minnesota

15:30-15:45 WeC19.1

Robust Adaptive MPC Using Uncertainty Compensation, pp. 1873-1878.

Tao, Ran; Zhao, Pan; Kolmanovsky, Ilya V.; Hovakimyan, Naira

15:45-16:00 WeC19.2

Data-Driven Control Synthesis Using Koopman Operator: A Robust Approach, pp. 1879-1884.

Eyuboglu, Mert; Powell, Nathan; Karimi, Alireza

16:00-16:15 WeC19.3

State Feedback Synthesis for Robust Performance with Probabilistic Parametric Uncertainty, pp. 1885-1890.

Caverly, Ryan James; Bageshwar, Vibhor

16:15-16:30 WeC19.4

Optimal Design of Disturbance Attenuation Feedback Controllers for Linear Dynamical Systems, pp. 1891-1896.

Mannini, Davide; Strässer, Robin; Rawlings, James B.

16:30-16:45 WeC19.5

Closed Loop Intent-Expressive Trajectory Planning and Intent Estimation, pp. 1897-1903.

Gah, Elikplim; Yong, Sze Zheng

16:45-17:00 WeC19.6

A Generalized Accelerated Gradient Optimization Method, pp. 1904-1908.

Wu, Alex (Xinting); Petersen, Ian R.; Ugrinovskii, Valery; Shames, Iman

WeC20 Pier 8

Filtering (Regular Session)

Chair: Georgiou, Tryphon T. — University of California, Irvine

Co-Chair: Ozay, Necmiye — Univ. of Michiv

15:30-15:45 WeC20.1

A Projection Filter Algorithm for Stochastic Systems with Correlated Noise and State-Dependent Measurement Covariance, pp. 1909-1914.

Fuady Emzir, Muhammad; Cheded, Lahouari

15:45-16:00 WeC20.2

Can Transformers Learn Optimal Filtering for Unknown Systems?, pp. 1915-1920.

Du, Zhe; Balim, Haldun; Oymak, Samet; Ozay, Necmiye

16:00-16:15 WeC20.3

Computational Optimal Transport and Filtering on Riemannian Manifolds, pp. 1921-1926.

Grange, Daniel; Al-Jarrah, Mohammad; Baptista, Ricardo; Taghvaei, Amirhossein; Georgiou, Tryphon T.; Tannenbaum, Allen

16:15-16:30 WeC20.4

H Filter Design for Discrete-Time LPV Systems, pp. 1927-1932.

Kang, Dongyeop; Park, Chaneun

16:30-16:45 WeC20.5

Differential Privacy in Nonlinear Dynamical Systems with Tracking Performance Guarantees, pp. 1933-1939.

Chowdhury, Dhrubajit; Goyal, Raman; Rane, Shantanu

16:45-17:00 WeC20.6

Optimal Control for Discrete-Time Systems under Bounded Disturbances, pp. 1940-1945.

Dogadin, Egor; Peregudin, Alexey; Shirokih, Dmitriy

WeC21 Pier 3

Parameter Identification for Battery Systems (Invited Session)

Chair: Zhang, Dong — University of Oklahoma

Co-Chair: Roy, Tanushree — Texas Tech University

Organizer: Zhang, — University of

Dong	Oklahoma
Organizer: Soudbakhsh, 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, Ziyou	University of Michigan, Ann Arbor
Organizer: Fogelquist, Jackson	University of California, Davis

15:30-15:45 WeC21.1

System Identification for Lithium-Ion Batteries with Nonlinear Coupled Electro-Thermal Dynamics Via Bayesian Optimization (I), pp. 1946-1951.

Tu, Hao; Lin, Xinfan; Wang, Yebin; Fang, Huazhen

15:45-16:00 WeC21.2

Investigating Identification Input Designs for Modelling Lithium-Ion Batteries with Hysteresis Using LPV Framework (I), pp. 1952-1958.

Sheikh, Abdul Muiz Ahmad; Bergveld, Hendrik Johannes; Donkers, M.C.F.

16:00-16:15 WeC21.3

Physics-Informed Neural Network for Discovering Systems with Unmeasurable States with Application to Lithium-Ion Batteries (I), pp. 1959-1964.

Kajiura, Yuichi; Espin, Jorge Esteban; Zhang, Dong

16:15-16:30 WeC21.4

Degradation Modes Identification of Lithium-Ion Batteries Based on Flexible Discharge Data, pp. 1965-1970.

Wang, Shuquan; Gao, Feng; Zhang, Yusen

16:30-16:45 WeC21.5

Sensitivity Analysis of Lithium-Ion Battery SoH Indicators: An Analytical Study (I), pp. 1971-1976.

Sepasiahooyi, Sara; Tang, Shuxia

16:45-17:00 WeC21.6

Parameter Estimation of Solid-Electrolyte-Interphase Based Ageing in the Doyle-Fuller-Newman Model Framework, pp. 1977-1982.

le Roux, Francis Anne; Bergveld, Hendrik Johannes; Donkers, M.C.F.

ThP1 Metro E/C

A Control Systems Approach to Cell Fate Reprogramming (Plenary Session)

Chair: Grover, Martha — Georgia Institute of Technology

Co-Chair: Leang, Kam K. — University of Utah

08:30-09:30 ThP1.1

A Control Systems Approach to Cell Fate Reprogramming, pp. 1983-1983.

Del Vecchio, Domitilla

ThE1 Metro E/C

Hybrid Dynamical Seeking Systems: Model-Free Feedback Decision-Making and Control (Eckman Plenary Session)

Chair: Murray, Richard M. — Caltech

10:00-11:00 ThE1.1

Hybrid Dynamical Seeking Systems: Model-Free Feedback Decision-Making and Control, pp. 1984-1984.

Poveda, Jorge I.

ThPo1 Metro E/C, Metro W, Harbour, Frontenec

Late-Breaking News Poster (Poster Session)

11:00-11:45 ThPo1.1

Intelligent System of the Grinding Robot for Spiral Welded Pipe, pp. 1985-1985.

Ayalew, Getachew Demeissie

11:00-11:45 ThPo1.2

*Advanced Bi-Layer Control System for Continuous Pharmaceutical Manufacturing Pilot-Plant**.

Singh, Ravendra

11:00-11:45 ThPo1.3

D-Stability for Discrete Time Closed-Loops Subject to Signal-To-Noise Ratio Constraints, pp. 1986-1986.

Rojas, Alejandro J.; Barbosa, Karina A.

11:00-11:45 ThPo1.4

Sampling Theorem for Exact Identification of Continuous-Time Nonlinear Systems Based on the Koopman Operator, pp. 1987-1987.

Zeng, Zhexuan; Yue, Zuogong; Mauroy, Alexandre; Goncalves, Jorge; Yuan, Ye

11:00-11:45 ThPo1.5

Latest Results on 24/7 Implementation of Neural Network Based Signal Control for Nimitz Highway in Honolulu, pp. 1988-1988.

Wang, Hong; Wang, Yiwei; Wang, Chieh (Ross); Shao, Yunli; Zhang, Guohui; Subramaniyan, Arun Bala

11:00-11:45 ThPo1.6

Data-Driven Controls of a Flapping Wing Unmanned Aerial Vehicle Inspired by Monarch Butterfly, pp. 1989-1989.

K. C., Tejaswi; Lee, Taeyoung

11:00-11:45 ThPo1.7

A Simulation Preorder for Koopman-Like Lifted Control Systems, pp. 1990-1990.

Aspeel, Antoine; Ozay, Necmiye

11:00-11:45 ThPo1.8

A Direct and Execution-Time-Certified Box-QP Algorithm for Input-Constrained MPC, pp. 1991-1991.

Wu, Liang; Braatz, Richard D.

11:00-11:45 ThPo1.9

Improving Positioning Accuracy Using Particle Filter with Enhanced IMU Velocity Estimation, pp. 1992-1992.

Pisarski, Dominik; Faraj, Rami; Jankowski, Łukasz; Konowrocki, Robert; Poplawski, Blazej

11:00-11:45 ThPo1.10

A Ball Launching Mechanism for Real-Time Control Education, pp. 1993-1993.

Moallem, Mehrdad; Mohagheghi, Afagh

11:00-11:45 ThPo1.11

Deep Monocular Relative 6D Pose Estimation for Ship-Based Autonomous UAV, pp. 1994-1994.

Wickramasuriya, Maneesha; Lee, Taeyoung; Snyder, Murray

11:00-11:45 ThPo1.12

Uniform Exponential Stability in Finite-Difference Model Reduction for Magnetizable Piezoelectric Beams with Non-Collocated Observers, pp. 1995-1995.

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

11:00-11:45 ThPo1.13

FPGA-Accelerated Particle Filter for High-Speed Target Localization in Edge Computing Devices, pp. 1996-1996.

Kim, Daeyeon; Kim, Nayeon; Lee, Heoncheol; Choi, Wonseok; Jeong, Bora; Cho, Youngki

11:00-11:45 ThPo1.14

Reinforcement Learning Enables Extreme Vehicle Lateral Maneuvers, pp. 1997-1997.

Yechiel, Oded; Suplin, Vladimir

11:00-11:45 ThPo1.15

Unlocking Floating Offshore Wind Potential: Layout Modification for Power Maximization, pp. 1998-1998.

Niu, Yue; Nagamune, Ryozo

11:00-11:45 ThPo1.16

Enhancing Nonlinear Chemical Process Monitoring with Neural Component Analysis Based Singular Spectrum Analysis (SSA-NCA), pp. 1999-1999.

Ndunda, Enock; Krishnannair, Syamala

11:00-11:45 ThPo1.17

A Superstructure Design for Sustainable Hydrogen Byproduct Production and CO2 Emission Mitigation, pp. 2000-2000.

Khaligh, Vahid; Ghezelbash, Azam; Niaz, Haider; Liu, Jay

11:00-11:45 ThPo1.18

Dynamic Extended-Output Observer Design for an Adaptive Vertical Farm Quadcopter, pp. 2001-2001.

Chnib, Echrak; Bagnerini, Patrizia; Gaggero, Mauro; Zemouche, Ali

11:00-11:45 ThPo1.19

Deep Reinforcement Learning Based Tracking Control of Van De Vusse Reactor, pp. 2002-2002.

Ankalugari, Rahul Yadav; M U, Abuthahir; Magbool Jan, Nabil; Joseph, Ajin George

11:00-11:45 ThPo1.20

Temperature Estimation in Lithium-Ion Batteries through Cascaded Electrochemical-Thermal Models, pp. 2003-2003.

Ferreira, Patryck; Tang, Shuxia

11:00-11:45 ThPo1.21

TUM CONTROL: Open Source Controller-Vehicle in Loop Simulation Framework for ultra-Rapid prototyping in Python, pp. 2004-2004.

Zarrouki, Baha; Betz, Johannes

11:00-11:45 ThPo1.22

Deep Reinforcement Learning Driven Adaptive Stochastic NMPC Reduces Conservatism, Enhances Feasibility and Improves Closed-Loop Performance, pp. 2005-2005.

Zarrouki, Baha; Wang, Chenyang; Betz, Johannes

11:00-11:45 ThPo1.23

Safe Deep Reinforcement Learning (RL) Agent Adapts the Cost Function Weights of a Weights-Varying MPC (WMPC), pp. 2006-2006.

Zarrouki, Baha; Spanakakis, Marios; Betz, Johannes

11:00-11:45 ThPo1.24

Noncontact Magnetic Manipulation Using Permanent Magnets, pp. 2007-2007.

Ekanayake, Lahiru; Weerasekara Mudiyanselage, Janaka Madhusankha; Basnet, Dhiraj; Komaee, Arash

11:00-11:45 ThPo1.25

Algebraic Prescribed-Time KKL Observer for Autonomous Nonlinear Systems, pp. 2008-2008.

Marani, Yasmine; N'Doye, Ibrahima; Laleg-Kirati, Taous-Meriem

11:00-11:45 ThPo1.26

Uncertainty Quantification in Physiological Modeling Using Bayesian Variational Autoencoders, pp. 2009-2009.

Estiri, Elham; Mirinejad, Hossein

11:00-11:45 ThPo1.27

Reinforcement Learning and Nonlinear Integrated Controller for Guaranteed Local Stability, pp. 2010-2010.

Nan, Shiqi; Chen, Chih-Chiang; Qian, Chunjiang

11:00-11:45 ThPo1.28

Benchmarking Surrogate Embedding Strategies for Model Predictive Control, pp. 2011-2011.

Elorza Casas, Carlos Andres; Pulsipher, Joshua; Ricardez-Sandoval, Luis

11:00-11:45 ThPo1.29

Properties of Immersions for Systems with Multiple Limit Sets with Implications to Learning Koopman Embeddings, pp. 2012-2012.

Liu, Zexiang; Ozay, Necmiye; Sontag, Eduardo

11:00-11:45 ThPo1.30

Particle Swarm Optimization for Training Quadrotor PID Controller, pp. 2013-2013.

Rodriguez, Eric; Dong, Wenjie; Lu, Qi

11:00-11:45 ThPo1.31

*On Control-Sync Technique for Multi-Task System Operation**.

Fateh, Fariba; Mirafzal, Behrooz

11:00-11:45 ThPo1.32

Staggered Steering of Wheeled-Legged Biped Robot, pp. 2014-2014.

Montufar, Sergio; Qian, William

11:00-11:45 ThPo1.33

Information-Based Anomaly Detection for Autonomous Agents, pp. 2015-2015.

McKee, Sasha M; Haddadin, Osama; Leang, Kam K.

11:00-11:45 ThPo1.34

Estimating the Lateral Stability Region of the Vehicle Using the Koopman Spectrum, pp. 2016-2016.

Kumar, Alok; Umathe, Bhagyashree; Vaidya, Umesh; Kelkar, Atul

11:00-11:45 ThPo1.35

*Self Organized Neural Network for Swarm Robots**.

Han, Zhifeng; Walton, Claire

11:00-11:45 ThPo1.36

Deep Neural Network In-Proximity Effect Detection and Collision Avoidance for Aerial Vehicles, pp. 2017-2017.

M Anderson, Jacob; Leang, Kam K.

11:00-11:45 ThPo1.37

Distribution-Matching Deployment: A Stein Variational Gradient Approach to Optimal Multisensor Placement, pp. 2018-2018.

Ghimire, Donipolo; Kia, Solmaz S.

11:00-11:45 ThPo1.38

*Real Application of Deep Reinforcement Learning for Multi-Agent Cooperation in Distributed Model-Based Predictive Control**.

Aponte Rengifo, Oscar Emilio; Francisco, Mario; Vega Cruz, Pastora

11:00-11:45 ThPo1.39

Improving Drone Control: Achieving Strong Stability and Adaptability Using Online Reinforcement Learning, pp. 2019-2019.

Avila, Ethan; Jaber, Halah; Frye, Michael

11:00-11:45 ThPo1.40

Parameter Design of P-PI Controller for Motion Control Systems Using Limited Pole Placement Methd, pp. 2020-2020.

Urakawa, Yoshiyuki; Ngamlamai, Sirichai

11:00-11:45 ThPo1.41

Cyber-Attack Detection by Using a Discrete-Time Model-Based Unknown Input Observer, pp. 2021-2021.

Nguyen, Quang Huy; Sadki, Osama; Rafaralahy, Hugues; Haddad, Madjid; Zemouche, Ali

11:00-11:45 ThPo1.42

*Closed-Loop Battery Manufacturing Process Control Via End-Of-Line Formation Features**.

Weng, Andrew; Less, Greg; Siegel, Jason B.; Stefanopoulou, Anna G.

11:00-11:45 ThPo1.43

Integrating Dynamic Risk Assessment with Model Predictive Control for Enhanced Safety and Operational Efficiency, pp. 2022-2022.

Akundi, Sahithi Srijana; Liu, Yuanxing; Braniff, Austin; Dantas, Beatriz; Niknezhad, Shayan Sean; Tian, Yuhe; Khan, Faisal; Pistikopoulos, Efstratios N.

ThB01 Metro E/C

Agents-Based Systems I (Regular Session)

Chair: Rai, Ayush — Purdue University

Co-Chair: Quijano, Nicanor — Universidad De Los Andes

13:30-13:45 ThB01.1

Optimal Distribution of UAVs in Crop Spraying Considering Energy Consumption, pp. 2023-2028.

Archila Cruz, Oscar Fabian; Quijano, Nicanor; Martinez-Piazuelo, Juan

13:45-14:00 ThB01.2

Formation Shape Control with Minimal Global Rigidity, pp. 2029-2034.

Sahebsara, Farid; de Queiroz, Marcio

14:00-14:15 ThB01.3

Observer-Based Consensus Strategy for Linear Multi-Agent Systems under Double Event-Triggering Conditions, pp. 2035-2040.

Ding, Haochen; Xin, Ming

14:15-14:30 ThB01.4

Global Attitude Alignment for Multi-Agent Systems on SO(3) without Angular Velocity Measurements, pp. 2041-2046.

Boughellaba, Mouaad; Tayebi, Abdelhamid

14:30-14:45 ThB01.5

Distributed Algorithm for Edge Agreement Over Nonlinear Constraints, pp. 2047-2052.

Rai, Ayush; Mou, Shaoshuai

14:45-15:00 ThB01.6

Two-Player Task Negotiation Based on Trust, pp. 2053-2059.

Kim, Donghae; Akella, Maruthi

ThB02 Harbour

Optimization, Consensus, and Games I: Constraints and Distributed Computation (Invited Session)

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

13:30-13:45 ThB02.1

Contractivity of Distributed Optimization and Nash Seeking Dynamics (I), pp. 2060-2065.

Gokhale, Anand; Davydov, Alexander; Bullo, Francesco

13:45-14:00 ThB02.2

Distributed Conjugate Gradient Method Via Conjugate Direction Tracking (I), pp. 2066-2073.

Shorinwa, Ola; Schwager, Mac

14:00-14:15 ThB02.3

Algorithms for Finding Compatible Constraints in Receding-Horizon Control of Dynamical Systems (I), pp. 2074-2081.

Parwana, Hardik; Wang, Ruiyang; Panagou, Dimitra

14:15-14:30 ThB02.4

Projected Push-Pull for Distributed Constrained Optimization Over Time-Varying Directed Graphs (I), pp. 2082-2089.

Akgun, Orhan Eren; Dayi, Arif Kerem; Gil, Stephanie; Nedich, Angelia

14:30-14:45 ThB02.5

Finite-Time Analysis of Asynchronous Multi-Agent TD Learning (I), pp. 2090-2097.

Dal Fabbro, Nicolò; Adibi, Arman; Mitra, Aritra; Pappas, George J.

14:45-15:00 ThB02.6

Decentralized and Equitable Optimal Transport (I), pp. 2098-2103.

Lau, Ivan; Ma, Shiqian; Uribe, Cesar A.

ThB03 Frontenac

Mechatronics I (Invited Session)

Chair: Shan, Jinjun	York University
Co-Chair: Al Janaideh, Mohammad	University of Guelph
Organizer: Al Janaideh, Mohammad	University of Guelph
Organizer: Rakotondrabe, Micky	ENIT Tarbes, INPT, University of Toulouse

13:30-13:45 ThB03.1

Particle Filtering on Lie Group for Mobile Robot Localization with Range-Bearing Measurements (I), pp. 2104-2109.

Zhang, Shuo; Shan, Jinjun; Liu, Yibo

13:45-14:00 ThB03.2

Retaining Physical Understanding through Discretization (I), pp. 2110-2115.

Abramovitch, Daniel Y.

14:00-14:15 ThB03.3

A Control Lyapunov Function-Based Approach for Particle Nanomanipulation Via Optical Tweezers (I), pp. 2116-2121.

Golgoon, Melika; Mohammadi, Alireza; Spong, Mark W.

14:15-14:30 ThB03.4

Towards Computationally Efficient NMPC Design with Stability Guarantee for Learning-Based Dynamic Models: A Case Study of UAVs (I), pp. 2122-2127.

Gomaa, Mahmoud A. K.; De Silva, Oscar; Jayasiri, Awantha; Mann, George K. I.

14:30-14:45 ThB03.5

Preliminary Results on Generalized Transmissibility Operators (I), pp. 2128-2133.

Aljanaideh, Khaled; Al Janaideh, Mohammad

14:45-15:00 ThB03.6

Decoupling and Tracking Control for Offshore Crane System Effect by Unknown Roll/Heave Wave Motions Disturbances (I), pp. 2134-2139.

Al Saaideh, Mohammad; Al-Solihat, Mohammed Khair; Al-Rawashdeh, Yazan Mohammad; Aljanaideh, Khaled; Al Janaideh, Mohammad

ThB04 Metro W

Estimation and Identification III (Regular Session)

Chair: Lahijanian, Morteza — University of Colorado Boulder

Co-Chair: Hinson, Kimber — The Boeing Company

13:30-13:45 ThB04.1

Formal Abstraction of General Stochastic Systems Via Noise Partitioning, pp. 2140-2145.

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

13:45-14:00 ThB04.2

A Flexible Wing Model Uncertainty Evaluation Based on an Autocovariance Least Squares Tuned Optimal Estimate, pp. 2146-2151.

Hinson, Kimber; Morgansen, Kristi A.

14:00-14:15 ThB04.3

Adaptive Pre-Processing Linear Output Regulation with Non-Vanishing Measurements, pp. 2152-2157.

Han, Qi; Wang, Lei; Marconi, Lorenzo; Liu, Zhitao; Su, Hongye

14:15-14:30 ThB04.4

Identification of Discrete Event Systems by Signal Interpreted Petri Nets, pp. 2158-2163.

Köhler, Andreas; Zhang, Ping

14:30-14:45 ThB04.5

Using Databases to Implement Algorithms: Estimation of Allan Variance Using B+ Tree Data Structure, pp. 2164-2169.

Maddipatla, Srivenkata Satya Prasad; Pakala, Rinith; Haeri, Hossein; Chen, Cindy; Jerath, Kshitij; Brennan, Sean

14:45-15:00 ThB04.6

Multiple Model Optimization-Based Estimators Using Horizon Scenario Tree (I), pp. 2170-2175.

Elsayed, Mahmoud N.; De Silva, Oscar; Jayasiri, Awantha; Mann, George K. I.; Gosine, Raymond G.

ThB05 Pier 2

Optimization III (Regular Session)

Chair: Yousefian, Farzad — Rutgers University

Co-Chair: Dai, Ran — Purdue University

13:30-13:45 ThB05.1

Adaptive Low-Rank Tensor Approximation Based on Mixed-Integer Representations, pp. 2176-2181.

Xu, Zhi; Chaoying, Pei; Dai, Ran

13:45-14:00 ThB05.2

Distributed Gradient Tracking Methods with Guarantees for Computing a Solution to Stochastic MPECs, pp. 2182-2187.

Ebrahimi, Mohammadjavad; Shanbhag, Uday V.; Yousefian, Farzad

14:00-14:15 ThB05.3

Mutual Learning in Optimization - Part II, pp.

2188-2193.

Narendra, Kumpati S.; Zheng, Lihao; Mukhopadhyay, Snehasis

14:15-14:30 ThB05.4

First-Order Dynamic Optimization for Streaming Convex Costs, pp. 2194-2199.

Rostami, Mohammadreza; Moradian, Hossein; Kia, Solmaz S.

14:30-14:45 ThB05.5

Efficient Computation of Weapon-Target Assignments Using Abstraction, pp. 2200-2205.

Elliott, D. Sawyer; Vatsan, Maansi

14:45-15:00 ThB05.6

Achieving Optimal Complexity Guarantees for a Class of Bilevel Convex Optimization Problems, pp. 2206-2211.

Samadi, Sepideh; Burbano Lombana, Daniel; Yousefian, Farzad

ThB06 Queens Quay 1

Modeling and Control of Energy Storage and Conversion Systems (Invited Session)

Chair: Zhang, Dong	University of Oklahoma
Co-Chair: Fogelquist, Jackson	University of California, Davis
Organizer: Zhang, Dong	University of Oklahoma
Organizer: Soudbakhsh, 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, Ziyou	University of Michigan, Ann Arbor
Organizer: Fogelquist, Jackson	University of California, Davis

13:30-13:45 ThB06.1

Data-Driven Koopman Model of an Integrated HVAC and Battery Cooling System in Electric Vehicles (I), pp. 2212-2217.

Chen, Youyi; Kwak, Kyoung Hyun; Jung, Dohoy; Kim, Youngki

13:45-14:00 ThB06.2

Hypergraph-Based Unified Model Development for Active Battery Equalization Systems (I), pp. 2218-2223.

Ouyang, Quan; Ghaeminezhad, Nourallah; Li, Yang; Wik, Torsten; Zou, Changfu

14:00-14:15 ThB06.3

Deep-MPC: A DAGGER-Driven Imitation Learning Strategy for Optimal Constrained Battery Charging (I), pp. 2224-2229.

Espin, Jorge Esteban; Zhang, Dong; Toti, Daniele; Pozzi, Andrea

14:15-14:30 ThB06.4

Data-Driven Model Predictive Control of Battery Storage Units, pp. 2230-2235.

Lipka, Johannes Bernd; Hans, Christian Andreas

14:30-14:45 ThB06.5

Koopman Operator-Based Detection-Isolation of Cyberattack: A Case Study on Electric Vehicle Charging (I), pp. 2236-2241.

Ghosh, Sanchita; Roy, Tanushree

14:45-15:00 ThB06.6

Hydrogen Underground Storage for Grid Resilience: A Dynamic Simulation and Optimization Study, pp. 2242-2247.

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

ThB07 Queens Quay 2

Traffic Control II (Regular Session)

Chair: Vehlhaber, Finn Niklas	Eindhoven University of Technology
Co-Chair: Malikopoulos, Andreas A.	Cornell University

13:30-13:45 ThB07.1

Alpha-Fair Routing in Urban Air Mobility with Risk-Aware Constraints, pp. 2248-2253.

Yu, Yue; Gao, Zhenyu; Li, Hui Qing; Wei, Qinshuang; Clarke, John-Paul; Topcu, Ufuk

13:45-14:00 ThB07.2

Potential-Based Controller for Efficient Flow of Connected and Automated Vehicles, pp. 2254-2259.

Tzortzoglou, Filippos; Theodosis, Dionysios; Dave, Aditya Deepak; Malikopoulos, Andreas A.

14:00-14:15 ThB07.3

Sequential Truck Platoon Formation in Mixed Traffic Using Multiple Spring Mass Damper Systems, pp. 2260-2265.

Narasimhan, Mukundhan; Du, Lili; Washburn, Scott

14:15-14:30 ThB07.4

Smoothing Mixed Traffic with Robust Data-Driven Predictive Control for Connected and Autonomous Vehicles, pp. 2266-2272.

Shang, Xu; Wang, Jiawei; Zheng, Yang

14:30-14:45 ThB07.5

Hybrid Model Predictive Control for Virtual Coupling of Heavy-Haul Trains, pp. 2273-2278.

Hou, Zhinan; You, Keyou

14:45-15:00 ThB07.6

Electric Aircraft Assignment, Routing, and Charge Scheduling Considering the Availability of Renewable Energy, pp. 2279-2284.

Vehlhaber, Finn Niklas; Salazar, Mauro

ThB08 Bay

Process Control Evolution and Challenges in Nuclear Power Plants (Tutorial Session)

Chair: Yu, Kevin	Ontario Power Generation
Co-Chair: Knutson, Mark	Ontario Power Generation
Organizer: Yu, Kevin	Ontario Power Generation

13:30-14:15 ThB08.1

Process Control Evolution and Challenges in Nuclear Power Plants (I), pp. 2285-2296.

Yu, Kevin; Knutson, Mark

14:15-15:00 ThB08.2

Load-Following Control of Nuclear Power Plants in the Age of Small Modular Reactors (I), pp. 2297-2297.

Zhang, Zhibo; Jiang, Jin

ThB09 Dockside 1

Autonomy, Learning, and Optimization for Spacecraft (Invited Session)

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

13:30-13:45 ThB09.1

Guaranteed Safe Satellite Guidance and Navigation Using Reachability Based Switching Controllers (I), pp. 2298-2303.

Miller, Kristina; Phillips, Sean; Mitra, Sayan

13:45-14:00 ThB09.2

Multi-Thread Learning and Adaptation for Spacecraft Attitude Control (I), pp. 2304-2310.

Hoobler, Richard; Akella, Maruthi

14:00-14:15 ThB09.3

Blameless and Optimal Control under Prioritized Safety Constraints (I), pp. 2311-2317.

Pavlasek, Natalia; Li, Hui Qing; Acikmese, Behcet; Oishi, Meeko; Danielson, Claus

14:15-14:30 ThB09.4

Chance-Constrained Control for Safe Spacecraft Autonomy: Convex Programming Approach (I), pp. 2318-2324.

Oguri, Kenshiro

14:30-14:45 ThB09.5

An Error Estimation and Mesh Refinement

Method Applied to Optimal Libration Point Orbit Transfers (I), pp. 2325-2330.

Haman, George III Victor; Rao, Anil V.

14:45-15:00 ThB09.6

Shielded Deep Reinforcement Learning for Complex Spacecraft Tasking (I), pp. 2331-2337.

Reed, Robert; Schaub, Hanspeter; Lahijanian, Morteza

ThB10 Dockside 2

Adaptive Control II (Regular Session)

Chair: Westwick, David — Schulich School of Engineering, University of Calgary

Co-Chair: Kamalapurkar, Rushikesh — Oklahoma State University

13:30-13:45 ThB10.1

Fractional-Order Integral Neural-Adaptive Update and Feedback Laws, pp. 2338-2343.

Doctolero, Samuel; Westwick, David

13:45-14:00 ThB10.2

Retrospective Cost-Based Extremum Seeking Control with Vanishing Perturbation for Online Output Minimization, pp. 2344-2349.

Paredes Salazar, Juan Augusto; Portella Delgado, Jhon Manuel; Bernstein, Dennis S.; Goel, Ankit

14:00-14:15 ThB10.3

Adaptive Output-Feedback Model Predictive Control of Hammerstein Systems with Unknown Linear Dynamics, pp. 2350-2355.

Kamaldar, Mohammadreza; Bernstein, Dennis S.

14:15-14:30 ThB10.4

An Adaptive Optimal Control Approach to Monocular Depth Observability Maximization, pp. 2356-2361.

Ogri, Tochukwu Elijah; Qureshi, Muzaffar; Bell, Zachary I.; Waters, Kristy; Kamalapurkar, Rushikesh

14:30-14:45 ThB10.5

Dynamic Adaptation Gains for Nonlinear Systems with Unmatched Uncertainties, pp. 2362-2367.

Lopez, Brett; Slotine, Jean-Jacques

14:45-15:00 ThB10.6

Hybrid Motion Planning and Formation Control of Multi-AUV Systems Based on DRL, pp. 2368-2373.

Hadi, Behnaz; Khosravi, Alireza; Sarhadi, Pouria

ThB11 Dockside 3

Autonomous Systems I (Regular Session)

Chair: Muradore, Riccardo — University of Verona

Co-Chair: Paternain, Santiago — Rensselaer Polytechnic Institute

13:30-13:45 ThB11.1

Distributed Safe Stabilization Control for Interconnected Time-Delay Systems, pp. 2374-2379.

Pan, Zhuo-Rui; Ren, Wei; Sun, Xi-Ming

13:45-14:00 ThB11.2

Interval Signal Temporal Logic from Natural Inclusion Functions, pp. 2380-2385.

Baird, Luke; Harapanahalli, Akash; Coogan, Samuel

14:00-14:15 ThB11.3

Allocation of Control Authority between Dynamic Inversion and Reinforcement Learning for Autonomous Helicopter Aerial Refueling, pp. 2386-2392.

Jayarathne, Damsara; Paternain, Santiago; Mishra, Sandipan

14:15-14:30 ThB11.4

A Twin-Delayed Deep Deterministic Policy Gradient Approach for UAV Formation Control, pp. 2393-2398.

Zhang, Yintao; Zhang, Youmin; Yu, Ziquan; Li, Jin; Qin, Qiaomeng; Gao, Chenxi

14:30-14:45 ThB11.5

Towards Aircraft Autonomy Using a POMDP-Based Planner, pp. 2399-2404.

Trotti, Francesco; Farinelli, Alessandro; Muradore, Riccardo

14:45-15:00 ThB11.6

A Submodular Approach to Controlled Islanding for Multi-Agent Network Stability, pp. 2405-2411.

Cheng, Shiyu; Clark, Andrew

ThB12 Dockside 9

Predictive Control for Linear Systems I (Regular Session)

Chair: Liu, Jinfeng — University of Alberta

Co-Chair: Yong, Sze Zheng — Northeastern University

13:30-13:45 ThB12.1

Control Barrier Functions for Linear Continuous-Time Input-Delay Systems with Limited-Horizon Previewable Disturbances, pp. 2412-2419.

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

14:00-14:15 ThB12.3

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

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

14:15-14:30 ThB12.4

On Terminal Set and Cost for Stability-Aware MPC for Sampled-Data Linear Systems with Continuous-Time Constraint: A Lifting Approach, pp. 2432-2439.

Kim, Junsoo; Park, Gyunghoon

14:30-14:45 ThB12.5

Time Robust Model Predictive Control for Heterogeneous Multi-Agent Systems under Global Temporal Logic Tasks, pp. 2440-2445.

Yang, Tiange; Zou, Yuanyuan; Liu, Jinfeng; Jia, Tianyu; Li, Shaoyuan

14:45-15:00 ThB12.6

Efficient Online Update of Model Predictive Control in Embedded Systems Using First-Order Methods, pp. 2446-2451.

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

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.

Lai, Wenxin; Li, Yuanlong; Lin, Zongli

13:45-14:00 ThB13.2

On the Equivalence between Prescribed Performance Control and Control Barrier Functions, pp. 2458-2463.

Namerikawa, Ryo; Wiltz, Adrian; Mehdifar, Farhad; Namerikawa, Toru; Dimarogonas, Dimos V.

14:00-14:15 ThB13.3

Global Finite Time Stabilization of SISO Hurwitz Linear Systems Subject to Actuator Saturation: The Case of Real Eigenvalues, pp. 2464-2469.

Hou, Tan; Li, Yuanlong; Lin, Zongli

14:15-14:30 ThB13.4

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

Zinage, Vrushabh; Chandra, Rohan; Bakolas, Efstathios

14:30-14:45 ThB13.5

Constrained Synchronization of Drive and Response Chaotic Systems with Parametric Uncertainty Using Barrier Lyapunov Function, pp. 2476-2481.

Singh, Shubham; Jain, Anoop

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

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

13:30-13:45 ThB14.1

Opportunistic Safety Outside the Maximal Controlled Invariant Set (I), pp. 2482-2487.

Liu, Zexiang; Chen, Hao; Gao, Yulong; Ozay, Necmiye

13:45-14:00 ThB14.2

Robust Model Predictive Control with Temporally-Uncertain Disturbance Preview Information (I), pp. 2488-2493.

Gostin, David; Koeln, Justin

14:00-14:15 ThB14.3

Learning of Energy Primitives for Electrified Aircraft (I), pp. 2494-2500.

Smith, Reid; Hencey, Brandon; Parry, Adam; Alleyne, Andrew G.

14:15-14:30 ThB14.4

Efficient and Guaranteed Hamilton-Jacobi Reachability Via Self-Contained Subsystem Decomposition and Admissible Control Sets (I), pp. 2501-2506.

He, Chong; Gong, Zheng; Chen, Mo; Herbert, Sylvia

14:30-14:45 ThB14.5

Forward Invariance in Neural Network Controlled Systems (I), pp. 2507-2512.

Harapanahalli, Akash; Jafarpour, Saber; Coogan, Samuel

14:45-15:00 ThB14.6

ZonoLAB: A MATLAB Toolbox for Set-Based Control Systems Analysis Using Hybrid Zonotopes (I), pp. 2513-2520.

Koeln, Justin; Bird, Trevor, J.; Siefert, Jacob; Ruths, Justin; Pangborn, Herschel; Jain, Neera

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: Demetriou, Michael A.	Worcester Polytechnic Institute
Organizer: Hu, Weiwei	University of Georgia

13:30-13:45 ThB15.1

Scalable Computation of H-Infinity Energy Functions for Polynomial Drift Nonlinear Systems (I), pp. 2521-2526.

Corbin, Nicholas; Kramer, Boris

13:45-14:00 ThB15.2

Adaptive Observer Design for a Multi-State Reparable System (I), pp. 2527-2532.

Hu, Weiwei; Demetriou, Michael A.

14:00-14:15 ThB15.3

Safe Control of Hyperbolic PDE-ODE Cascades (I), pp. 2533-2538.

Wang, Ji; Krstic, Miroslav

14:15-14:30 ThB15.4

Spaces of Exact Boundary Controllability of a Schrodinger Equation with an Internal Point Mass (I), pp. 2539-2544.

Hansen, Scott

14:30-14:45 ThB15.5

Safety Factor Profile Regulation Via Self-Triggered Model Predictive Control in the EAST Tokamak (I), pp. 2545-2550.

Wang, Zibo; Paruchuri, Sai Tej; Yang, Lixing; Schuster, Eugenio

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

Organizer: Sharma, Himanshu — Pacific Northwest National Laboratory

13:30-13:45 ThB16.1

Control Co-Design of Automotive Vapor Compression Systems (I), pp. 2551-2557.

Russell, Kayla; Alleyne, Andrew G.

13:45-14:00 ThB16.2

Control Co-Design of a Ducted Hydrokinetic Turbine (I), pp. 2558-2563.

Naik, Kartik Praful; Liao, Yingqian; Jiang, Boxi; Martins, Joaquim R.R.A.; Sun, Jing

14:00-14:15 ThB16.3

A Set-Based Approach for Robust Control Co-Design (I), pp. 2564-2571.

Bird, Trevor, J.; Siefert, Jacob; Pangborn, Herschel; Jain, Neera

14:15-14:30 ThB16.4

Site-Dependent Solutions of Wave Energy Converter Farms with Surrogate Models, Control Co-Design, and Layout Optimization (I), pp. 2572-2579.

Azad, Saeed; Herber, Daniel R.; Khanal, Suraj; Jia, Gaofeng

14:30-14:45 ThB16.5

Multi-Objective Control Co-Design Using Graph Based Optimization for Offshore Wind Farm Grid Integration (I), pp. 2580-2585.

Sharma, Himanshu; Wang, Wei; Huang, Bowen; Ramachandran, Thiagarajan; Adetola, Veronica

ThB17 Dockside 5

Distributed Control II (Regular Session)

Chair: Cichella, Venanzio — University of Iowa

Co-Chair: Jensen, Emily — University of California, Berkeley

13:30-13:45 ThB17.1

Coordinated Path Following of UAVs Over Time-Varying Digraphs Connected in an Integral Sense, pp. 2586-2591.

Kang, Hyungsoo; Kaminer, Isaac; Cichella, Venanzio; Hovakimyan, Naira

13:45-14:00 ThB17.2

A Convex Parameterization of Controllers Constrained to Use Only Relative Measurements, pp. 2592-2597.

Marshall, Walden; Bamieh, Bassam; Jensen, Emily

14:00-14:15 ThB17.3

Distributed Adaptive Control for a DC Power Distribution System of a Series-Hybrid-Electric Propulsion System of a Commuter Aircraft, pp. 2598-2603.

Syed, Wasif Haider; Machado Martínez, Juan Eduardo; Schiffer, Johannes

14:15-14:30 ThB17.4

Stability and Regret Bounds on Distributed Truncated Predictive Control for Networked Dynamical Systems, pp. 2604-2611.

Xu, Eric; Qu, Guannan

14:30-14:45 ThB17.5

Distributed Neighbor Selection for Second-Order Semi-Autonomous Networks, pp. 2612-2617.

Yang, Jingbo; Wei, Haoyu; Pan, Lulu; Shao, Haibin; Li, Dewei; Lu, Yang

14:45-15:00 ThB17.6

Strongly Stabilizing LQR Output Feedback Designs Via Parametric and Non-Parametric Procedures, pp. 2618-2623.

Bahavarnia, MirSaleh; Taha, Ahmad

ThB18 Dockside 6

Stability of Nonlinear Systems II (Regular Session)

Chair: Lee, Donghwan — KAIST

Co-Chair: Chen, Chih-Chiang — National Cheng Kung University

13:30-13:45 ThB18.1

Stabilization for a Class of Positive Bilinear Systems, pp. 2624-2629.

Kawano, Yu; Cucuzzella, Michele

13:45-14:00 ThB18.2

Local Stability Analysis and Estimation of Domains of Attraction for Discrete-Time Takagi-Sugeno Fuzzy Systems Via Fuzzy-Modeled Membership Functions, pp. 2630-2635.

Marinho, Yara Quilles; Lee, Donghwan; Oliveira, Ricardo C. L. F.; Peres, Pedro L. D.

14:00-14:15 ThB18.3

LMI Design Procedure for Incremental Input/Output-To-State Stability in Nonlinear Systems, pp. 2636-2641.

Arezki, Hasni; Zemouche, Ali; Alessandri, Angelo; Bagnerini, Patrizia

14:15-14:30 ThB18.4

Bounded Output Feedback Control of Planar Systems with Unknown Nonlinear Structures and Application to Output Consensus, pp. 2642-2647.

Chen, Chih-Chiang; He, Shuaipeng; Qian, Chunjiang

14:30-14:45 ThB18.5

Global Uniform Ultimate Boundedness of Semi-Passive Systems Interconnected Over Directed Graphs, pp. 2648-2653.

Lazri, Anes; Maghenem, Mohamed Adlene; Panteley, Elena; Loria, Antonio

ThB19 Pier 7

Uncertain Systems I (Regular Session)

Chair: Halder, Abhishek — Iowa State University

Co-Chair: Liu, Changliu — Carnegie Mellon University

13:30-13:45 ThB19.1

Safety-Certified Data-Driven Model Predictive Control for Linear Systems, pp. 2654-2659.

Khaledi, Marjan; Tooranjipour, Pouria; Kiumarsi, Bahare

13:45-14:00 ThB19.2

Output Feedback Position Tracking Control of Marine Vessels Subject to Periodic Disturbances, pp. 2660-2665.

Kurtoglu, Deniz; Tatlicioglu, Enver; Zergeroglu, Erkan

14:00-14:15 ThB19.3

Command Governor Mechanism for Uncertain Multi-Agent Systems with Actuator Dynamics, pp. 2666-2671.

Kurttisi, Atahan; Dogan, Kadriye; Sarioglu, N. Eren; Deniz, Meryem

14:15-14:30 ThB19.4

Multimodal Safe Control for Human-Robot Interaction, pp. 2672-2678.

Pandya, Ravi; Wei, Tianhao; Liu, Changliu

14:30-14:45 ThB19.5

Exact Computation of LTI Reach Set from Integrator Reach Set with Bounded Input, pp. 2679-2684.

Haddad, Shadi; Khodary, Pansie; Halder, Abhishek

14:45-15:00 ThB19.6

Optimal Capture Strategy Design Based on Reinforcement Learning in the Pursuit-Evasion Game with Unknown Dynamics, pp. 2685-2690.

Jia, Yupeng; Dong, Yi

ThB20 Pier 8

Sensors and Sensing Systems (Regular Session)

Chair: Chhabra, Robin — Carleton University

Co-Chair: Bopardikar, Shaunak D. — Michigan State University

13:30-13:45 ThB20.1

Real-Time Sensor-Based Feedback Control for Obstacle Avoidance in Unknown Environments, pp. 2691-2696.

Smaili, Lyes; Berkane, Soulaimane

13:45-14:00 ThB20.2

Sequential Sensor Fusion for Slip Estimation in Mobile Robots, pp. 2697-2702.

Zarei-Jalalabadi, Mahboubeh; Chhabra, Robin

14:00-14:15 ThB20.3

Average Consensus with Error Correction, pp. 2703-2708.

Benalcazar, Diego R,; Magnusson, Sindri; Enyioha, Chinwendu

14:15-14:30 ThB20.4

Matrix Concentration Inequalities for Sensor Selection, pp. 2709-2714.

Calle, Christopher I.; Bopardikar, Shaunak D.

14:30-14:45 ThB20.5

A Low Rank Approach to Minimize Sensor-To-Actuator Communication in Finite Horizon Output Feedback, pp. 2715-2720.

Aspeel, Antoine; Nylof, Jakob; Li, Jing

Shuang (Lisa); Ozay, Necmiye

ThB21 Pier 3

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

13:30-13:45 ThB21.1

Multi-Timescale System Separation Via Data-Driven Identification within a Singular Perturbation Framework, pp. 2721-2727.

Park, Seho; Pangborn, Herschel

13:45-14:00 ThB21.2

Efficient Local Validation of Partially Ordered Models Via Bayesian Directed Sampling, pp. 2728-2733.

Kellan, Moorse; Murray, Richard M.

14:00-14:15 ThB21.3

Metropolis-Adjusted Langevin Algorithm with SPSA-Approximated Gradients, pp. 2734-2739.

Sun, Shiqing; Spall, James C.

14:15-14:30 ThB21.4

An Adaptation of the AAA-Interpolation Algorithm for Model Reduction of MIMO Systems, pp. 2740-2745.

Jonas, Jared; Bamieh, Bassam

14:30-14:45 ThB21.5

Computing Invariant Zeros of a Linear System Using State-Space Realization, pp. 2746-2751.

Portella Delgado, Jhon Manuel; Goel, Ankit

ThC01 Metro E/C

Agents-Based Systems II (Regular Session)

Chair: Cenedese, Angelo — University of Padova

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

15:30-15:45 ThC01.1

An Active-Sensing Approach for Bearing-Based Target Localization, pp. 2752-2757.

Pozzan, Beniamino; Michieletto, Giulia; Mesbahi, Mehran; Cenedese, Angelo

15:45-16:00 ThC01.2

Optimal Evasion from a Sensing-Limited Pursuer, pp. 2758-2765.

Maity, Dipankar; Von Moll, Alexander; Shishika, Daigo; Dorothy, Michael

16:00-16:15 ThC01.3

Multi-Agent Trajectory Planning with NUV Priors, pp. 2766-2771.

van Erp, Bart; Bagaev, Dmitry; Podusenko, Albert; Senoz, Ismail; de Vries, Bert

16:15-16:30 ThC01.4

Evolution of Opinions under Social Pressure on Random Graphs, pp. 2772-2777.

Tang, Jennifer; Ajorlou, Amir; Jadbabaie, Ali

16:30-16:45 ThC01.5

Resilient Consensus State Observer for Nonlinear Systems and against Attacks, pp. 2778-2783.

Qu, Zhihua; Simaan, Marwan A.

16:45-17:00 ThC01.6

Decentralised Collaborative Iterative Learning Control for Multi-Agent Systems Point-To-Point Channel Tracking, pp. 2784-2789.

Chen, Shangcheng; Freeman, Christopher T.

ThC02 Harbour

Optimization, Consensus, and Games II: Networked Agents (Invited Session)

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

15:30-15:45 ThC02.1

Nash Equilibrium Seeking Over Digraphs with Row-Stochastic Matrices and Network-Independent Step-Sizes (I), pp. 2790-2795.

Nguyen, Duong; Bianchi, Mattia; Dörfler, Florian; Nguyen, Duong; Nedich, Angelia

15:45-16:00 ThC02.2

Estimating True Beliefs from Declared Opinions (I), pp. 2796-2801.

Tang, Jennifer; Adler, Aviv; Ajorlou, Amir; Jadbabaie, Ali

16:00-16:15 ThC02.3

Network Preference Dynamics Using Lattice Theory (I), pp. 2802-2808.

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

16:15-16:30 ThC02.4

Heterogeneous Distributed Subgradient (I), pp. 2809-2815.

Lin, Yixuan; Gamarra, Marco; Liu, Ji

16:30-16:45 ThC02.5

Distributed Optimization-Based State Estimation of Nonlinear Dynamical Systems (I), pp. 2816-2821.

Wang, Lili; Sundaram, Shreyas; LeGrand, Keith

16:45-17:00 ThC02.6

The Role of Confidence for Trust-Based Resilient Consensus, pp. 2822-2829.

Ballotta, Luca; Yemini, Michal

ThC03 Frontenac

Robotics I (Regular Session)

Chair: Aschemann, Harald — University of Rostock

Co-Chair: Sanfilippo, Filippo — University of Southeast Norway (USN), Faculty of Technology, Natural Sciences and Maritime Sciences

15:30-15:45 ThC03.1

Multi-Domain Walking with Reduced-Order Models of Locomotion, pp. 2830-2837.

Dai, Min; Lee, Jaemin; Ames, Aaron D.

15:45-16:00 ThC03.2

Quadrupedal Locomotion Control on Inclined Surfaces Using Collocation Method, pp. 2838-2843.

Salagame, Adarsh; Gianello, Maria Victoria; Wang, Chenghao; Venkatesh Krishnamurthy, Kaushik; Pitroda, Shreyansh; Rajput, Rohit Hiraman; Sihite, Eric; Leeser, Miriam; Ramezani, Alireza

16:00-16:15 ThC03.3

Adaptive Manoeuvring Control for Planar Snake Robots in Uncertain Friction Environments, pp. 2844-2850.

Chitikena, Hareesh; Gravdahl, Irja; Pettersen, Kristin Y.; Mohammadi, Alireza; Sanfilippo, Filippo; Stavdahl, Øyvind; Ma, Shu-Gen

16:15-16:30 ThC03.4

Nonlinear Motion Control of a Multirotor Slung Load System: Experimental Results, pp. 2851-2857.

Jiang, Zifei; Yu, Yanwen; Lynch, Alan Francis

16:30-16:45 ThC03.5

Comparative Analysis of Multiple Deep Reinforcement Learning Approaches for Collision-Free Path-Planning of a 3-DoF-Robot, pp. 2858-2864.

Weishaupt, Sven; Husmann, Ricus; Aschemann, Harald; Schlenther, Nils; Oehlschlaegel, Thimo; Steinbrecher, Christian

16:45-17:00 ThC03.6

RL-PGO: Reinforcement Learning-Based Planar Pose-Graph Optimization, pp. 2865-2870.

Kourtzanidis, Nikolaos; Saeedi, Sajad

ThC04 Metro W

Nonlinear Systems Identification (Regular Session)

Chair: Paruchuri, Sai Tej — Lehigh University

Co-Chair: Allen, Brendon C. — Auburn University

15:30-15:45 ThC04.1

Invariance and Approximation of Koopman

Operators in Native Spaces, pp. 2871-2878.

Powell, Nathan; Paruchuri, Sai Tej; Niu, Shengyuan; Bouland, Ali; Kurdila, Andrew J.

15:45-16:00 ThC04.2

Sparse Identification of Nonlinear Dynamics with Side Information (SINDy-SI), pp. 2879-2884.

Machado, Gabriel Freitas; Jones, Morgan

16:00-16:15 ThC04.3

Augmentation of a Lyapunov-Based Deep Neural Network Controller with Concurrent Learning for Control-Affine Nonlinear Systems, pp. 2885-2890.

Basyal, Sujata; Ting, Jonathan; Mishra, Kislaya; Allen, Brendon C.

16:15-16:30 ThC04.4

Output-Only Identification of Lur'e Systems with Hysteretic Feedback Nonlinearities, pp. 2891-2896.

Richards, Riley J.; Yang, Yulong; Paredes Salazar, Juan Augusto; Bernstein, Dennis S.

16:30-16:45 ThC04.5

Structural Risk Minimization for Learning Nonlinear Dynamics, pp. 2897-2904.

Stamouli, Charis; Chatzipantazis, Evangelos; Pappas, George J.

16:45-17:00 ThC04.6

Iterative ESO-Based Data-Driven Active Disturbance Rejection Learning Control of Czochralski Silicon Single Crystal Growth Process, pp. 2905-2910.

Ren, Junchao; Liu, Ding; Wan, Yin; Shi, Shuyan; Liu, Yuyu

ThC05 Pier 2

Optimization IV (Regular Session)

Chair: Yilmaz, Cemal Tugrul — UC San Diego

Co-Chair: Yousefian, Farzad — Rutgers University

15:30-15:45 ThC05.1

System Design Approach for Control of Differentially Private Dynamical Systems, pp. 2911-2917.

Goyal, Raman; Chowdhury, Dhrubajit; Rane, Shantanu

15:45-16:00 ThC05.2

Controlling the Exploitation/exploration Trade-Off in Global Optimization: A Set Membership Approach, pp. 2918-2923.

Alborghetti, Mattia; Montecchio, Giulio; Sabug, Lorenzo Jr.; Fagiano, Lorenzo; Ruiz, Fredy

16:00-16:15 ThC05.3

Online Regulation of Dynamical Systems to Solutions of Constrained Optimization Problems, pp. 2924-2929.

Chen, Yiting; Cothren, Liliaokeawawa; Cortes, Jorge; Dall'Anese, Emiliano

16:15-16:30 ThC05.4

Data-Driven Bayesian Nonparametric Wasserstein Distributionally Robust Optimization, pp. 2930-2935.

Ma, Xutao; Ning, Chao

16:30-16:45 ThC05.5

Perfect Tracking of Time-Varying Optimum by Extremum Seeking, pp. 2936-2943.

Yilmaz, Cemal Tugrul; Diagne, Mamadou; Krstic, Miroslav

ThC06 Queens Quay 1

Power Systems and Electronics (Regular Session)

Chair: Sira-Ramirez, Hebertt — CINVESTAV

Co-Chair: Norman, Kevin — Texas Tech University

15:30-15:45 ThC06.1

Control of Parallel Solar-Battery Systems Enabled by a Theta-Converter Topology, pp. 2944-2949.

Norman, Kevin; Ren, Beibei; Zhong, Qing-Chang

15:45-16:00 ThC06.2

ESO-Based Resonant Internal Model Molding Scheme with Application to Current Control of LCL-Type Grid-Tied Inverters, pp. 2950-2957.

Bao, Zhengyang; Ye, Yongqiang; Xiong, Yongkang; Zhao, Qiangsong

16:00-16:15 ThC06.3

Control Designs for Critical-Continegency

Responsible Grid-Following Inverters and Seamless Transitions to and from Grid-Forming Modes, pp. 2958-2963.

Park, Jaesang; Askarian, Alireza; Salapaka, Srinivasa M.

16:15-16:30 ThC06.4

The Role of Solar Market Mechanisms in Distributed Panel Investment, pp. 2964-2970.

Davoudi, Mehdi; Qin, Junjie; Lin, Xiaojun

16:30-16:45 ThC06.5

Sliding Mode Control of Switched Hamitonian Systems, pp. 2971-2976.

Sira-Ramirez, Hebertt; Gómez-León, Brian Camilo; Aguilar-Orduña, Mario Andrés

16:45-17:00 ThC06.6

On the ADRC Control of Dynamically Feedback Linearizable Systems: A Cascade Buck-Buck DC-DC Converter Example, pp. 2977-2982.

Gómez-León, Brian Camilo; Aguilar-Orduña, Mario Andrés; Sira-Ramirez, Hebertt; Garrido-Moctezuma, Ruben

ThC07 Queens Quay 2

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

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

15:30-15:45 ThC07.1

Parametric Modeling for Personalized Braking of Electric Vehicles in Full-Stop Scenarios (I), pp. 2983-2988.

Kwak, Kyoung Hyun; Kim, Youngki; Holmer, Justin; Kim, Heeseong; Chen, Yue-Ming Chen; Lee, Hyeonjik; Link, Brian

15:45-16:00 ThC07.2

Real-Time Eco-Driving of a Connected and Automated Fuel Cell Electric Truck Using Approximate Dynamic Programming (I), pp. 2989-2994.

Shiledar, Ankur; Gupta, Shobhit; Spano, Matteo; Villani, Manfredi; Canova, Marcello; Rizzoni, Giorgio

16:00-16:15 ThC07.3

Joint Optimization of Charging Infrastructure Placement and Operational Schedules for a Fleet of Battery Electric Trucks (I), pp. 2995-3000.

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

16:15-16:30 ThC07.4

A Driver-Centric Long-Trip Schedule Optimizer for Battery Electric Vehicles (I), pp. 3001-3006.

Su, Zifei; Chen, Pingen

16:30-16:45 ThC07.5

Location-Routing Problem for Electric Delivery Vehicles with Mobile Charging Trailers (I), pp. 3007-3012.

Innis, Cody; Chen, Pingen

ThC08 Bay

Process Control (Regular Session)

Chair: Koch, Charles Robert	University of Alberta
Co-Chair: Singh, Ravendra	Rutgers

15:30-15:45 ThC08.1

Energy Scheduling and Control of Grid-Interactive Communities with Physically Consistent Deep Learning, pp. 3013-3018.

Xiao, Tianqi; You, Fengqi

15:45-16:00 ThC08.2

Linear Model Predictive Control for Two-Dimensional Transport-Reaction Processes, pp. 3019-3024.

Akbarnezhad, Mahdis; Ozorio Cassol, Guilherme; Koch, Charles Robert; Dubljevic, Stevan

16:00-16:15 ThC08.3

Data-Driven Economic Predictive Control of Wastewater Treatment Process with Input-Output Koopman Operator, pp. 3025-3030.

Han, Minghao; Yao, Jingshi; Adrian Wing-Keung, Law; Yin, Xunyuan

16:15-16:30 ThC08.4

Simulation-Based Approach for Optimal Control of a Stefan Problem, pp. 3031-3036.

Srisuma, Prakitr; Barbastathis, George; Braatz, Richard D.

16:30-16:45 ThC08.5

Experimental Validation of a Fractional Order Autotuner for a Two Rotor Aerodynamical System, pp. 3037-3042.

Muresan, Cristina-Ioana; Mihai, Marcian; Hegedus, Erwin; Kozma, Elisabeta; Birs, Isabela

16:45-17:00 ThC08.6

Machine Learning-Based Estimation and Accommodation of Multiple Sensor Faults in Sampled-Data Process Systems, pp. 3043-3048.

Gajjar, Aatam; El-Farra, Nael H.

ThC09 Dockside 1

Multi-Agent Spacecraft Control (Invited Session)

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

15:30-15:45 ThC09.1

Rigid Body Attitude Cluster Consensus Control on Weighted Cooperative-Competitive Networks (I), pp. 3049-3054.

Butcher, Eric; Maadani, Mohammad

15:45-16:00 ThC09.2

An Autonomous Satellite Collision Avoidance and Adversary Evasion Path Planning Algorithm for the Space Environment (I), pp. 3055-3061.

Mehlman, Cameron; Falco, Gregory

16:00-16:15 ThC09.3

Distributed Nonlinear Filtering Using Triangular Transport Maps (I), pp. 3062-3067.

Grange, Daniel; Baptista, Ricardo; Taghvaei, Amirhossein; Tannenbaum, Allen; Phillips, Sean

16:15-16:30 ThC09.4

Solar-Drag Spacecraft Formation Control with Particle Swarm Optimization-Based Guardian Maps, pp. 3068-3073.

Chihabi, Yazan; Ulrich, Steve

16:30-16:45 ThC09.5

Time Shift Governor for Constrained Control of Spacecraft Orbit and Attitude Relative Motion in Bicircular Restricted Four-Body Problem, pp. 3074-3080.

Kim, Taehyeun; Kolmanovsky, Ilya V.; Girard, Anouck

16:45-17:00 ThC09.6

Mass Flow Control Design for a Reusable Liquid Propelled Rocket Engine Using Contraction Theory, pp. 3081-3087.

Gibart, Jules; Piet-Lahanier, Helene; Farago, Francois

ThC10 Dockside 2

Adaptive Control III (Regular Session)

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

15:30-15:45 ThC10.1

Uncalibrated Adaptive Robot Visual Servoing on Image Space with Parameter Convergence, pp. 3088-3093.

Li, Zhiwen; Lai, Beixian; Li, Weibing; Zhang, Jun; Pan, Yongping

15:45-16:00 ThC10.2

A Dual-Loop Sliding-Mode Scheme for Uncertain Nonlinear Systems, pp. 3094-3099.

Zhong, Hongli; Zhong, Zhixiong; Huan, Zhijie; Lam, Hak-Keung

16:00-16:15 ThC10.3

Real-Time Implementation of a Spiking Neural Network-Based Control: An Application for the Ball and Plate System, pp. 3100-3105.

Chavez Arana, Diego; Garcia Alcantara, Omar Alejandro; Rubio Scola, Ignacio; Espinoza Quesada, Eduardo Steed; Garcia Carrillo, Luis Rodolfo; Sornborger, Andrew T.

16:15-16:30 ThC10.4

A Note on the Estimation of Von Neumann and Relative Entropy Via Quantum State Observers, pp. 3106-3111.

Balas, Mark; Griffith, Tristan; Gehlot, Vinod

16:30-16:45 ThC10.5

MRAC with Adaptive Uncertainty Bounds Via Operator-Valued Reproducing Kernels, pp. 3112-3117.

Wang, Haoran; Scurlock, Brian; Powell, Nathan; L'Afflitto, Andrea; Kurdila, Andrew J.

16:45-17:00 ThC10.6

Adaptive Real-Time Numerical Differentiation with Variable-Rate Forgetting and Exponential Resetting, pp. 3118-3123.

Verma, Shashank; Lai, Brian; Bernstein, Dennis S.

ThC11 Dockside 3

Autonomous Systems II (Regular Session)

Chair: Thorpe, Adam — University of Texas at Austin

Co-Chair: Oishi, Meeko — University of New Mexico

15:30-15:45 ThC11.1

Spiking Neural Network-Based Control of an Unmanned Aerial System Implemented on a Customized Neural Flight Simulation Environment, pp. 3124-3129.

Garcia Alcantara, Omar Alejandro; Chavez Arana, Diego; Espinoza Quesada, Eduardo Steed; Rubio Scola, Ignacio; Garcia Carrillo, Luis Rodolfo; Sornborger, Andrew T.

15:45-16:00 ThC11.2

Physics-Informed Kernel Embeddings: Integrating Prior System Knowledge with Data-Driven Control, pp. 3130-3137.

Thorpe, Adam; Neary, Cyrus; Djeumou, Franck; Oishi, Meeko; Topcu, Ufuk

16:00-16:15 ThC11.3

A V2V Approach to Assured Aircraft Emergency Road Landings, pp. 3138-3145.

Tekaslan, Huseyin Emre; Atkins, Ella M.

16:15-16:30 ThC11.4

Distributed Event-Triggered Consensus of Uncertain Multi-Agent Systems under a Directed Graph, pp. 3146-3151.

Yang, Yanhua; Mei, Jie; Ma, Guangfu

16:30-16:45 ThC11.5

Safety-Critical Control of Nonholonomic Vehicles in Dynamic Environments Using Velocity Obstacles, pp. 3152-3159.

Haraldsen, Aurora; Wiig, Martin Syre; Ames, Aaron D.; Pettersen, Kristin Y.

16:45-17:00 ThC11.6

Cluster Consensus of the Matrix-Weighted Network on a Negative Circle, pp. 3160-3165.

Wang, Chongzhi; Shao, Haibin; Li, Dewei

ThC12 Dockside 9

Predictive Control for Linear Systems II (Regular Session)

Chair: Santos, Tito Luís Maia — Federal University of Bahia

Co-Chair: Shen, Chao — Carleton University

15:30-15:45 ThC12.1

Contingency Model Predictive Control for Bipedal Locomotion on Moving Surfaces with a Linear Inverted Pendulum Model, pp. 3166-3171.

Chen, Kuo; Huang, Xinyan; Chen, Xunjie; Yi, Jingang

15:45-16:00 ThC12.2

MPC Based Linear Equivalence with Control Barrier Functions for VTOL-UAVs, pp. 3172-3177.

Ali, Ali Mohamed; Hashim, Hashim A; Shen, Chao

16:00-16:15 ThC12.3

Data-Driven Predictive Control Using Closed-Loop Data: An Instrumental Variable Approach, pp. 3178-3183.

Wang, Yibo; Qiu, Yiwen; Sader, Malika; Huang, Dexian; Shang, Chao

16:15-16:30 ThC12.4

Data-Driven Min-Max MPC for Linear Systems, pp. 3184-3189.

Xie, Yifan; Berberich, Julian; Allgöwer, Frank

16:30-16:45 ThC12.5

Analytical Reference Compensation for Tracking Dynamic Target Signals with Linear Robust MPC Strategies, pp. 3190-3195.

Santos, Tito Luís Maia; Pereira, Bruno

16:45-17:00 ThC12.6

An Encrypted Model Predictive Control Strategy for Resilience Operations, pp. 3196-3201.

Franze, Giuseppe; Puig, Vicenc; Tedesco, Francesco

ThC13 Richmond

Advanced Methods in Control (Regular Session)

Chair: Kawano, Yu — Hiroshima University

Co-Chair: Broucke, Mireille E. — Univ. of Toronto

15:30-15:45 ThC13.1

Distributed Secret Securing in Discrete-Event Systems, pp. 3202-3207.

Matsui, Shoma; Cai, Kai; Rudie, Karen

15:45-16:00 ThC13.2

Polynomial Lyapunov Functions and Invariant Sets from a New Hierarchy of Quadratic Lyapunov Functions for LTV Systems, pp. 3208-3214.

Abdelraouf, Hassan; Feron, Eric; Shamma, Jeff S.

16:00-16:15 ThC13.3

Assuring Safety of Vision-Based Swarm Formation Control, pp. 3215-3222.

Hsieh, Chiao; Koh, Yubin; Li, Yangge; Mitra, Sayan

16:15-16:30 ThC13.4

Using Reward Shaping to Train Cognitive-Based Control Policies for Intelligent Tutoring Systems, pp. 3223-3230.

Yuh, Madeleine; Rabb, Ethan; Thorpe, Adam; Jain, Neera

16:30-16:45 ThC13.5

Balancing for Nonlinear Differential-Algebraic Control Systems, pp. 3231-3236.

Sarkar, Arijit; Kawano, Yu; Scherpen, Jacquelien M.A.

16:45-17:00 ThC13.6

Optimal Steady-State Regulation Using an Internal Model and State Feedback, pp. 3237-3244.

Hafez, Mohamed Ashraf; Broucke, Mireille E.

ThC14 Wellington

Risk-Aware Design and Control (Invited Session)

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

15:30-15:45 ThC14.1

Risk-Constrained Reinforcement Learning for Inverter-Dominated Power System Controls (I), pp. 3245-3250.

Kwon, Kyung-bin; Mukherjee, Sayak; Vu, Thanh Long; Zhu, Hao

15:45-16:00 ThC14.2

Regret and Conservatism of Distributionally Robust Constrained Stochastic Model Predictive Control (I), pp. 3251-3257.

Pfefferkorn, Maik; Renganathan, Venkatraman; Findeisen, Rolf

16:00-16:15 ThC14.3

Constrained Stochastic Games Including Risk-Sensitive Utility (I), pp. 3258-3263.

Singh, Vartika; Veeraruna, Kavitha

16:15-16:30 ThC14.4

Data-Driven Distributionally Robust Mitigation of Risk of Cascading Collisions (I), pp. 3264-3269.

Liu, Guangyi; Amini, Arash; Pandey, Vivek; Motee, Nader

16:30-16:45 ThC14.5

Learning of Nash Equilibria in Risk-Averse Games (I), pp. 3270-3275.

Wang, Zifan; Shen, Yi; Zavlanos, Michael M.; Johansson, Karl H.

16:45-17:00 ThC14.6

Risk-Aware Fixed-Time Stabilization of Stochastic Systems under Measurement Uncertainty (I), pp. 3276-3283.

Black, Mitchell; Fainekos, Georgios; Hoxha, Bardh; Panagou, Dimitra

ThC15 Yonge

Estimation and Control of Distributed Parameter Systems IV (Invited Session)

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

15:30-15:45 ThC15.1

Semismooth Newton Method for Boundary Bilinear Control (I), pp. 3284-3289.

Casas Rentería, Eduardo; Chrysafinos, Konstantinos; Mateos, Mariano

15:45-16:00 ThC15.2

Finite Dimensional Stabilizing Controllers for a Class of Distributed Parameter Systems (I), pp. 3290-3295.

Yegin, M. Oguz; Ozbay, Hitay

16:00-16:15 ThC15.3

From Sontag's to Cardano-Lyapunov Formula for Systems Not Affine in the Control: Convection-Enabled PDE Stabilization (I), pp. 3296-3301.

Belhadjoudja, Mohamed Camil; Krstic, Miroslav; Maghenem, Mohamed Adlene; Witrant, Emmanuel

16:15-16:30 ThC15.4

Artificial Compression POD Reduced Order Model for Control of MHD Flows (I), pp. 3302-3307.

Ravindran, S.S.

16:30-16:45 ThC15.5

Sum of Squares Approximations to Energy Functions (I), pp. 3308-3315.

Adjerid, Hamza; Borggaard, Jeff

ThC16 Dockside 4

Dynamics and Control of Wave Energy Converters (Invited Session)

Chair: Zuo, Lei	Univeristy 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

15:30-15:45 ThC16.1

On the Controllability of an Active Mechanical Motion Rectifier for Wave Energy Converters (I), pp. 3316-3321.

Fornaro, Pedro; Ringwood, John V.

15:45-16:00 ThC16.2

Time-Varying Hydrodynamic Model of a Variable-Geometry Oscillating Surge Wave Energy Converter (I), pp. 3322-3327.

Demonte Gonzalez, Tania; Tom, Nathan; Parker, Gordon G.

16:00-16:15 ThC16.3

Impact of Biofouling on Point Absorber Wave Energy Converter Performance and Control (I), pp. 3328-3333.

Skrovanek, David; Brekken, Ted

16:15-16:30 ThC16.4

Towards the Optimal Control of an Active Mechanical Motion Rectifier Power Take-Off Using Dynamic Programming (I), pp. 3334-3339.

Yang, Lisheng; Li, Xiaofan; Zuo, Lei

ThC17 Dockside 5

Modeling and Identification I (Regular Session)

Chair: Shakib, Fahim — Imperial College London

Co-Chair: Rhinehart, R. Russell — Oklahoma State Univ. - Retired

15:30-15:45 ThC17.1

Bootstrapped Gaussian Mixture Model-Based Data-Driven Forward Stochastic Reachability Analysis, pp. 3340-3345.

Choi, Joonwon; Park, Hyunsang; Hwang, Inseok

15:45-16:00 ThC17.2

Linguistic Modeling: Validation, Improvement, and Uncertainty, pp. 3346-3351.

Rhinehart, R. Russell

16:00-16:15 ThC17.3

A Comparison between Markov Chain and Koopman Operator Based Data-Driven Modeling of Dynamical Systems, pp. 3352-3358.

Tafazzol, Saeid; Li, Nan; Kolmanovsky, Ilya V.; Filev, Dimitar P.

16:15-16:30 ThC17.4

A Parameterised Family of neuralODEs Optimally Fitting Steady-State Data, pp. 3359-3364.

Shakib, Fahim; Scarciotti, Giordano; Astolfi, Alessandro

16:30-16:45 ThC17.5

Moving-Window Integrated Physics-Data-Based Modeling of Lateral Dynamics, pp. 3365-3370.

Wei, Wenpeng; Yin, Guodong; Wang, Jinxiang; He, Tianyi

ThC18 Dockside 6

Stability of Nonlinear Systems III (Regular Session)

Chair: Strong, Amy — Duke University

Co-Chair: Andersson, Sean — Boston University B.

15:30-15:45 ThC18.1

Confidence-Aware Safe and Stable Control of Control-Affine Systems, pp. 3371-3376.

Wei, Shiqing; Krishnamurthy, Prashanth; Khorrami, Farshad

15:45-16:00 ThC18.2

Improved Small Signal L2-Gain Analysis for Nonlinear Systems, pp. 3377-3382.

Strong, Amy; Lavaei, Reza; Bridgeman, Leila J.

16:00-16:15 ThC18.3

Approximating Regions of Attraction Via Flow-Control Barrier Functions and Constrained Polytope Expansion, pp. 3383-3390.

Ubellacker, Wyatt; Csomay-Shanklin, Noel; Ames, Aaron D.

16:15-16:30 ThC18.4

On Decomposition and Convergence of Distributed Optimization Algorithms, pp. 3391-3396.

Wu, Wuwei; Zhang, Shiqi; Li, Zhongkui; Chen, Jie; Georgiou, Tryphon T.

16:30-16:45 ThC18.5

Synthesizing Controller for Safe Navigation Using Control Density Function, pp. 3397-3402.

Moyalan, Joseph; Krishnamoorthy Shankara Narayanan, Sriram Sundar; Zheng, Andrew; Vaidya, Umesh

16:45-17:00 ThC18.6

Lyapunov Neural Network with Region of Attraction Search, pp. 3403-3410.

Wang, Zili; Andersson, Sean B.; Tron, Roberto

ThC19 Pier 7

Uncertain Systems II (Regular Session)

Chair: Komaee, Arash — Southern Illinois University

Co-Chair: Choi, Hyungjin — Sandia National Laboratories

15:30-15:45 ThC19.1

Security Constrained Uncertainty Interval Estimation Using Sensitivity Trajectories in Dynamical Systems, pp. 3411-3416.

Choi, Hyungjin; Elliott, Ryan; Venkat, Dhruva; Trudnowski, Daniel J.

15:45-16:00 ThC19.2

Data-Driven Distributionally Robust Safety Verification Using Barrier Certificates and Conditional Mean Embeddings, pp. 3417-3423.

Schön, Oliver; Zhong, Zhengang; Soudjani, Sadegh

16:00-16:15 ThC19.3

Minimal Gelbrich Distance to Uncorrelation, pp. 3424-3429.

Borelle, Matthieu; Alamo, Teodoro; Stoica, Cristina; Bertrand, Sylvain; Camacho, Eduardo F.

16:15-16:30 ThC19.4

Approximate Optimal Indirect Control of an Unknown Agent within a Dynamic Environment Using a Lyapunov-Based Deep Neural Network, pp. 3430-3435.

Philor, Jhyv; Makumi, Wanjiku A.; Bell, Zachary I.; Dixon, Warren E.

16:30-16:45 ThC19.5

Formal Synthesis of Safety Controllers for Unknown Systems Using Gaussian Process Transfer Learning, pp. 3436-3441.

Awan, Asad Ullah; Zamani, Majid

16:45-17:00 ThC19.6

Midrange Estimation for Sensor Fusion, pp. 3442-3447.

Komaee, Arash

ThC20 Pier 8

Observers for Linear Systems (Regular Session)

Chair: Ozer, Ahmet Ozkan	Western Kentucky University
Co-Chair: Hamel, Tarek	I3S-CNRS-UCA

15:30-15:45 ThC20.1

Boundary Output Feedback Stabilization for a Novel Magnetizable Piezoelectric Beam Model, pp. 3448-3453.

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

15:45-16:00 ThC20.2

A Necessary and Sufficient Condition for State Omniscience of Linear Time-Invariant Distributed Estimators, pp. 3454-3459.

Hays, Christopher; Phillips, Sean; Henderson, Troy

16:00-16:15 ThC20.3

Cyber-Attack Detection and Isolation in Event-Based Cyber-Physical Systems, pp. 3460-3466.

Eslami, Ali; Khorasani, Khashayar

16:15-16:30 ThC20.4

State Estimation for Linear Systems with Quadratic Outputs, pp. 3467-3472.

Berkane, Soulaimane; Theodosis, Dionysios; Dimarogonas, Dimos V.; Hamel, Tarek

16:30-16:45 ThC20.5

Parameter Estimation-Based States Reconstruction of Uncertain Linear Systems with Overparameterization and Unknown Additive Perturbations, pp. 3473-3479.

Glushchenko, Anton; Lastochkin, Konstantin

ThC21 Pier 3

Fault Detection and Monitoring of Energy Storage Systems for Increased Safety and Cycle (Invited Session)

Chair: Soudbakhsh, Damoon	Temple University
Co-Chair: Lin, Xinfan	University of California, Davis
Organizer: Zhang, Dong	University of Oklahoma
Organizer: Soudbakhsh, 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, Ziyou	University of Michigan, Ann Arbor
Organizer: Fogelquist, Jackson	University of California, Davis

15:30-15:45 ThC21.1

Real-Time Internal Short Circuit Detection in Li-Ion Battery Modules During Field Use (I), pp. 3480-3485.

Ahmadzadeh, Omidreza; Tewari, Deepti; Jeevarajan, Judith; Soudbakhsh, Damoon

15:45-16:00 ThC21.2

Post-Damage Short Circuit Detection in Lithium-Ion Batteries (I), pp. 3486-3491.

Bhaskar, Kiran; Moon, Jihoon; Rahn, Christopher D.

16:00-16:15 ThC21.3

Differential Voltage Analysis and Patterns in Parallel-Connected Pairs of Imbalanced Cells (I), pp. 3492-3497.

Wong, Clement; Weng, Andrew; Pannala, Sravan; Choi, Jeesoon; Siegel, Jason B.; Stefanopoulou, Anna G.

16:15-16:30 ThC21.4

Emergency Battery Discharge under Safety Constraints Using Optimization-Based Controllers (I), pp. 3498-3503.

Ebrahimi, Iman; De Castro, Ricardo; Tran, Vivian; Stefanopoulou, Anna G.; Feng, Shuang

FrP1	Metro E/C
Automatic Control in the Era of Artificial Intelligence (Plenary Session)	
Chair: Leang, Kam K.	University of Utah
Co-Chair: Grover, Martha	Georgia Institute of Technology

08:30-09:30 FrP1.1

Automatic Control in the Era of Artificial Intelligence, pp. 3504-3504.

Borrelli, Francesco

FrA01	Metro E/C
RI: Learning and Optimization (RI Session)	
Chair: Chhabra, Robin	Carleton University
Co-Chair: Yi, Jingang	Rutgers University

10:00-10:03 FrA01.1

Utilizing Load Shifting for Optimal Compressor Sequencing in Industrial Refrigeration, pp. 3505-3510.

Konda, Rohit; Chandan, Vikas; Crossno, Jesse; Pollard, Blake; Walsh, Daniel; Bohonek, Rick; Marden, Jason R.

10:03-10:06 FrA01.2

Exponential Stability of Primal-Dual Gradient Method for Distributed Convex Strongly Concave Minimax Problem, pp. 3511-3516.

Hu, Binxin; Liang, Shu

10:06-10:09 FrA01.3

Communication-Constrained STL Task Decomposition through Convex Optimization, pp. 3517-3523.

Marchesini, Gregorio; Liu, Siyuan; Lindemann, Lars; Dimarogonas, Dimos V.

10:09-10:12 FrA01.4

Learning-Based Hierarchical Model Predictive Control for Drift Vehicles, pp. 3524-3530.

Zhou, Bei; Hu, Cheng; Shi, Yao; Hu, Xiaorong; Xie, Lei; Su, Hongye

10:12-10:15 FrA01.5

Real-Time Safety Index Adaptation for Parameter-Varying Systems Via Determinant Gradient Ascend, pp. 3531-3536.

Chen, Rui; Zhao, Weiye; Liu, Ruixuan; Zhang, Weiyang; Liu, Changliu

10:15-10:18 FrA01.6

Sample Complexity of Chance Constrained Optimization in Dynamic Environment, pp. 3537-3544.

Shukla, Apurv; Zhang, Qian; Xie, Le

10:18-10:21 FrA01.7

Analysis of Backtracking A for Resource Constrained Shortest Path Problems*, pp. 3545-3550.

Ford, Bryce; Kumar, Mrinal

10:21-10:24 FrA01.8

Guaranteeing Service in Connected Microgrids: Storage Planning and Optimal Power Sharing Policy, pp. 3551-3556.

Dey, Arnab; Khatana, Vivek; Mani, Ankur; Salapaka, Murti V.

10:24-10:27 FrA01.9

Learning in Stochastic Stackelberg Games, pp. 3557-3562.

Das, Pranoy; Nortmann, Benita Alessandra Lucia; Ratliff, Lillian J.; Gupta, Vijay; Mylvaganam, Thulasi

10:27-10:30 FrA01.10

Incentivized Exploration of Non-Stationary Stochastic Bandits, pp. 3563-3569.

Chakraborty, Sourav; Chen, Lijun

10:30-10:33 FrA01.11

Does Online Gradient Descent (and Variants) Still Work with Biased Gradient and Variance?, pp. 3570-3575.

Al-Tawaha,, Ahmad; Jin, Ming

10:33-10:36 FrA01.12

Physics-Informed RL for Maximal Safety Probability Estimation, pp. 3576-3583.

Hoshino, Hikaru; Nakahira, Yorie

10:36-10:39 FrA01.13

Learning-To-Control Relaxation Systems with the Step Response, pp. 3584-3589.

Drummond, Ross; Taghavian, Hamed; Baldivieso Monasterios, Pablo Rodolfo

10:39-10:42 FrA01.14

An Iterative Method for Computing Controlled Reach-Avoid Sets, pp. 3590-3597.

Ren, Dejin; Wu, Taoran; Xue, Bai

10:42-10:45 FrA01.15

ChatMPC: Natural Language Based MPC Personalization, pp. 3598-3603.

Miyaoka, Yuya; Inoue, Masaki; Nii, Tomotaka

10:45-10:48 FrA01.16

Compression Repair for Feedforward Neural Networks Based on Model Equivalence Evaluation, pp. 3604-3609.

Mo, Zihao; Yang, Yejiang; Lu, Shuaizheng; Xiang, Weiming

10:48-10:51 FrA01.17

Verification-Aided Learning of Neural Network Barrier Functions with Termination Guarantees, pp. 3610-3617.

Chen, Shaoru; Ogunmolu, Olalekan; Fazlyab, Mahyar

10:51-10:54 FrA01.18

Obstacle-Free Trajectory Planning of an Uncertain Space Manipulator: Learning from a Fixed-Based Manipulator, pp. 3618-3624.

Sze, Timothy; Chhabra, Robin

10:54-10:57 FrA01.19

Learning and Optimization for Price-Based Demand Response of Electric Vehicle Charging, pp. 3625-3630.

Gu, Chengyang; Pan, Yuxin; Liu, Ruohong; Chen, Yize

10:57-11:00 FrA01.20

Optimal Tracking of Uncertain Linear Discrete-Time Systems Using Trajectory-Dependent Lifelong Q-Learning, pp. 3631-3636.

Geiger, Maxwell; Narayanan, Vignesh; Jagannathan, Sarangapani

FrA02 Harbour

RI: Advances in Optimal Control (RI Session)

Chair: Andersson, Sean B. — Boston University

Co-Chair: Yao, Bin — Purdue University

10:00-10:03 FrA02.1

Optimal Assignment for Multiplayer Target Defense Differential Games Via Analytical Geometric Approach, pp. 3637-3642.

Long, Yanchen; Han, Liang; Dong, Fei; Hu, Qinglei; Li, Qingdong

10:03-10:06 FrA02.2

Stack Degradation Protection of FCEVs Via Predictive Energy Management Strategy with Segmented Roads, pp. 3643-3649.

Park, GeunYoung; Choi, Kyunghwan; Kum, Dongsuk

10:06-10:09 FrA02.3

A Fisher Information Based Receding Horizon Control Method for Signal Strength Model Estimation, pp. 3650-3655.

Zhu, Yancheng; Andersson, Sean B.

10:09-10:12 FrA02.4

Synchronization Error Elimination for Heterogeneous Discrete-Time Multi-Agent Systems: A Reinforcement Learning Design Approach, pp. 3656-3661.

Wang, Xinyang; Guay, Martin; Wang, Shimin; Zhang, Hongwei

10:12-10:15 FrA02.5

Energy Optimal Control of a Harmonic Oscillator with a State Inequality Constraint, pp. 3662-3667.

Zhou, Mi; Verriest, Erik I.; Abdallah, Chaouki T.

10:15-10:18 FrA02.6

Stability Analysis of Hypersampled Model Predictive Control, pp. 3668-3673.

Gautam, Yaashia; Nicotra, Marco M

10:18-10:21 FrA02.7

Searching for Sparse Controllers with a Budget: A Bottom-Up Approach, pp. 3674-3679.

Baddam, Vasanth Reddy; Gumussoy, Suat; Eldardiry, Hoda; Boker, Almuatazbellah

10:21-10:24 FrA02.8

Safe Predefined-Time Stability and Optimal Feedback Control: A Lyapunov-Based Approach, pp. 3680-3685.

Kokolakis, Nick-Marios T.; Vamvoudakis, Kyriakos G.

10:24-10:27 FrA02.9

A Unifying Statement for an H-Infinity Optimal Controller with Positivity Properties, pp. 3686-3691.

Vladu, Emil

10:27-10:30 FrA02.10

Composition of Control Barrier Functions with Differing Relative Degrees for Safety under Input Constraints, pp. 3692-3697.

Rabiee, Pedram; Hoagg, Jesse B.

10:30-10:33 FrA02.11

Time-Varying Soft-Maximum Control Barrier Functions for Safety in an a Priori Unknown Environment, pp. 3698-3703.

Safari, Amirsaeid; Hoagg, Jesse B.

10:33-10:36 FrA02.12

An Output Feedback Game-Theoretic Approach for Defense against Stealthy GNSS Spoofing Attacks, pp. 3704-3709.

Athalye, Surabhi; Fotiadis, Filippos; Vamvoudakis, Kyriakos G.; Hugues, Jerome

10:36-10:39 FrA02.13

A Case Study on the Convergence of Direct Policy Search for Linear Quadratic Gaussian Control, pp. 3710-3715.

Keivan, Darioush; Seiler, Peter; Dullerud, Geir E.; Hu, Bin

10:39-10:42 FrA02.14

Asynchronous Block Parallel Policy Optimization for the Linear Quadratic Regulator, pp. 3716-3721.

Sha, Xingyu; You, Keyou

10:42-10:45 FrA02.15

Control Barrier Functions in Dynamic UAVs for Kinematic Obstacle Avoidance: A Collision Cone Approach, pp. 3722-3727.

Tayal, Manan; Singh, Rajpal; Keshavan, Jishnu; Nadubettu Yadukumar, Shishir

10:45-10:48 FrA02.16

Optimal Charging Control and Incentivization Strategies for Electric Vehicles Considering Grid Dynamical Constraints, pp. 3728-3733.

Podder, Amit Kumer; Sadamoto, Tomonori; Chakrabortty, Aranya

10:48-10:51 FrA02.17

A Safe and Computationally Efficient Tracking Control Algorithm for Autonomous Vehicles, pp. 3734-3739.

Notomista, Gennaro; Wardi, Yorai

10:51-10:54 FrA02.18

Time-Optimal Constrained Adaptive Robust Control of Single-DOF Mechanical Systems: A Comparative Study with BLF-Based Methods, pp. 3740-3745.

Liu, Yingqiang; Chen, Zheng; Yao, Bin

10:54-10:57 FrA02.19

Optimal Pinning Control for Synchronization Over Temporal Networks, pp. 3746-3751.

Sahaya Arokiadoss, Aandrew Baggio; Kalaimani, Rachel Kalpana

FrA03 Frontenac

RI: Control of Robotic and Mechatronic Systems (RI Session)

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

Co-Chair: Karimi, Alireza — EPFL

10:00-10:03 FrA03.1

Safe Human-Robot Motor Skill Learning through Probabilistic Dynamic Movement Primitives and Control Barrier Functions, pp. 3752-3759.

Theofanidis, Michail; Davoodi, Mohammadreza; Hafezi, Hamid; Gans, Nicholas

10:03-10:06 FrA03.2

Collision-Free Landing of Multiple UAVs on Moving Ground Vehicles Using Time-Varying Control Barrier Functions, pp. 3760-3767.

Sankaranarayanan, Viswa Narayanan; Saradagi, Akshit; Satpute, Sumeet; Nikolakopoulos, George

10:06-10:09 FrA03.3

Learning-Based Tracking Control of Unknown Robot Systems with Online Parameter Estimation, pp. 3768-3774.

Peng, Zhinan; Chen, Chen; Luo, Rui; Zhang, Jingting; Cheng, Hong; Ghosh, Bijoy

10:09-10:12 FrA03.4

Learning-Based Design of Off-Policy Gaussian Controllers: Integrating Model

Predictive Control and Gaussian Process Regression, pp. 3775-3782.

Tekumatla, Shiva; Gampa, Varun; Farzan, Siavash

10:12-10:15 FrA03.5

A Novel Multivariate Skew-Normal Mixture Model and Its Application in Path-Planning for Very-Large-Scale Robotic Systems, pp. 3783-3790.

Zhu, Pingping; Liu, Chang; Estephan, Peter

10:15-10:18 FrA03.6

Adaptive Impedance and Admittance Controls for Physical Human-Robot Interaction with Force-Sensorless, pp. 3791-3796.

Ngo, Van-Tam; Liu, Yen-Chen

10:18-10:21 FrA03.7

Modeling Reluctance Actuator Topologies with a Focus on Stiffness, pp. 3797-3802.

Pumphrey, Michael Joseph; Al Saaideh, Mohammad; Alatawneh, Natheer; Al Janaideh, Mohammad

10:21-10:24 FrA03.8

Motion Control of a Cable Robotic LED Light Fixture with IoT Connectivity, pp. 3803-3808.

Tavakoli, Negar; Mohagheghi, Afagh; Moallem, Mehrdad

10:24-10:27 FrA03.9

A Robust Sliding-Mode Control Framework for Quadrotors Subject to Model Uncertainty and External Disturbances, pp. 3809-3814.

Yang, Yefeng; Huang, Tao; Wang, Tianqi; Chih-Yung, Wen

10:27-10:30 FrA03.10

Precision ZP Perforation Automation: A Vision-Based Robotic Approach for Blastocyst Embryo Biopsy, pp. 3815-3820.

Abu Ajamieh, Ihab; Al Janaideh, Mohammad; Mills, James K.

10:30-10:33 FrA03.11

Flux Estimation and Control Based on High-Gain Observer for Variable Reluctance Actuator Using the Measured Current Only, pp. 3821-3826.

Al Saaideh, Mohammad; Alatawneh, Natheer; Aljanaideh, Omar; Al Janaideh, Mohammad

10:33-10:36 FrA03.12

Risk-Based Socially-Compliant Behavior Planning for Autonomous Driving, pp. 3827-3832.

Lyu, Yiwei; Luo, Wenhao; Dolan, John

10:36-10:39 FrA03.13

Joint Trajectory Optimization for Redundant Manipulators with Constant Path Speed, pp. 3833-3840.

Fried, Jonathan; Paternain, Santiago

10:39-10:42 FrA03.14

Adaptive Backstepping Control of a Bicopter in Pure Feedback Form with Dynamic Extension, pp. 3841-3846.

Portella Delgado, Jhon Manuel; Mirtaba, Mohammad; Goel, Ankit

10:42-10:45 FrA03.15

Hybrid Task Constrained Incremental Planner for Robot Manipulators in Confined Environments, pp. 3847-3852.

Sun, Yifan; Zhao, Weiye; Liu, Changliu

10:45-10:48 FrA03.16

Data-Driven Frequency-Based Feedforward Control Design for a Robotic Arm Joint, pp. 3853-3858.

Schuchert, Philippe; Karimi, Alireza

10:48-10:51 FrA03.17

A Sliding Cone Control Method for Robust Robot Running, pp. 3859-3866.

Lo, Chun Ho, David; Ng, Wee Shen; Chu, Xiangyu; Au, Kwok Wai Samuel

10:51-10:54 FrA03.18

Adaptive Nonlinear Control of a Bicopter with Unknown Dynamics, pp. 3867-3872.

Portella Delgado, Jhon Manuel; Goel, Ankit

10:54-10:57 FrA03.19

EMPC-Based Flight Controller Design for a Quadrotor with Unbalanced Payload, pp. 3873-3878.

Zhang, Xiangyu; Mu, Bingxian; Yoon, Se Young (Pablo)

10:57-11:00 FrA03.20

Newton-Raphson Flow for Aggressive Quadrotor Tracking Control, pp. 3879-3884.

Morales-Cuadrado, Evanns; Llanes, Christian; Wardi, Yorai; Coogan, Samuel

FrA04 Metro W

RI: Stochastic and Nonlinear Systems (RI Session)

Chair: Morgansen, Kristi A. — University of Washington

Co-Chair: Coogan, Samuel — Georgia Institute of Technology

10:00-10:03 FrA04.1

Uncertainty Quantification for Recursive Estimation in Adaptive Safety-Critical Control, pp. 3885-3890.

Cohen, Max; Mann, Makai; Leahy, Kevin; Belta, Calin

10:03-10:06 FrA04.2

Uncertainty and Its Effect on Optimal Multidrug Control of Hemodynamic Variables, pp. 3891-3896.

Popescu, Teodora; Birs, Isabela; Ben Othman, Ghada; Yumuk, Erhan; Mihai, Marcian; Hegedus, Erwin; Copot, Dana; De Keyser, Robin M.C.; Ionescu, Clara; Muresan, Cristina-Ioana

10:06-10:09 FrA04.3

Approximating Probabilistic Boundary of Future State Trajectory by Minimum-Volume Polynomial Sublevel Sets with Chance Constraints, pp. 3897-3902.

Shen, Xun; Wang, Ye

10:09-10:12 FrA04.4

On the Complexity of Computing the Minimum Mean Square Error of Causal Prediction, pp. 3903-3908.

Boche, Holger; Pohl, Volker; Poor, H. Vincent

10:12-10:15 FrA04.5

Average Cost Optimality of Partially Observed MDPs: Contraction of Non-Linear Filters and Existence of Optimal Solutions and Approximations, pp. 3909-3914.

Demirci, Yunus emre; Kara, Ali Devran; Yuksel, Serdar

10:15-10:18 FrA04.6

Conditions for Altruistic Perversity in Two-Strategy Population Games, pp. 3915-3920.

Hill, Colton; Brown, Philip N.; Paarporn, Keith

10:18-10:21 FrA04.7

Prosumers Participation in Markets: A Scalar-Parameterized Function Bidding Approach, pp. 3921-3926.

Alawad, Abdullah; Zaman, Muhammad Aneeq uz; Alshehri, Khaled; Basar, Tamer

10:21-10:24 FrA04.8

Optimal Detection for Bayesian Attack Graphs under Uncertainty in Monitoring and Reimaging, pp. 3927-3934.

Kazeminajafabadi, Armita; Ghoreishi, Seyede Fatemeh; Imani, Mahdi

10:24-10:27 FrA04.9

Density Steering of Gaussian Mixture Models for Discrete-Time Linear Systems, pp. 3935-3940.

Balci, Isin M; Bakolas, Efstathios

10:27-10:30 FrA04.10

Negative Feedback Regulation Via an Autapse Enhances Neuronal Firing Precision, pp. 3941-3946.

Vahdat, Zahra; Gambrell, Oliver; Singh, Abhyudai

10:30-10:33 FrA04.11

Real-Time Spatial Trajectory Planning under Lateral Constraints, pp. 3947-3953.

Ruof, Jona; Mertens, Max Bastian; Buchholz, Michael; Dietmayer, Klaus Christian Jürgen

10:33-10:36 FrA04.12

Data-Driven Output Feedback Control Based on Behavioral Approach, pp. 3954-3959.

Qin, Zhaoming; Karimi, Alireza

10:36-10:39 FrA04.13

Flow Sensing and Feedback Control for Maintaining School Cohesion in Uncoordinated Flapping Swimmers, pp. 3960-3965.

Hang, Haotian; Heydari, Sina; Kanso, Eva

10:39-10:42 FrA04.14

Sampled-Data Output Feedback Control of the Stefan Problem with Explicit Condition of Sampling Scheduling, pp. 3966-3971.

Koga, Shumon

10:42-10:45 FrA04.15

Observability-Based Sensor Selection for a Planar Bending Beam Attached to a Rotating

Body, pp. 3972-3979.

Brace, Natalie; Morgansen, Kristi A.

10:45-10:48 FrA04.16

Nonlinear Horizon-One Model Predictive Control for Resource-Limited Applications, pp. 3980-3986.

Olucak, Jan; Fichter, Walter; Cunis, Torbjørn

10:48-10:51 FrA04.17

Discontinuous Barrier Functions for Piecewise Continuous Dynamics, pp. 3987-3992.

Jimenez Cortes, Carmen; Thitsa, Makhin; Coogan, Samuel

10:51-10:54 FrA04.18

Adaptive Controller with Novel Phase Estimator for LLC Resonant Converter, pp. 3993-3998.

Mahdizadeh Shalmaei, Amir Hossein; Tavan, Mehdi; Soltani, Mohsen; Hajizadeh, Amin

10:54-10:57 FrA04.19

Robust and HÃ¶lder-Continuous Finite-Time Stabilization of Rigid Body Attitude Dynamics Using Rotation Matrices, pp. 3999-4004.

Wang, Ningshan; Hamrah, Reza; Sanyal, Amit

10:57-11:00 FrA04.20

Reach-Avoid Analysis for Sampled-Data Systems with Measurement Uncertainties, pp. 4005-4011.

Wu, Taoran; Ren, Dejin; Zhang, Shuyuan; Wang, Lei; Xue, Bai

FrB01 Metro E/C

Learning (Regular Session)

Chair: Liu, Jun University of Waterloo

Co-Chair: Anderson, James Columbia University

13:30-13:45 FrB01.1

Risk-Aware Distributed Multi-Agent Reinforcement Learning, pp. 4012-4019.

Maruf, Abdullah Al; Niu, Luyao; Ramasubramanian, Bhaskar; Clark, Andrew; Poovendran, Radha

13:45-14:00 FrB01.2

Zubov-Koopman Learning of Maximal Lyapunov Function, pp. 4020-4025.

Meng, Yiming; Zhou, Ruikun; Liu, Jun

14:00-14:15 FrB01.3

Learning High-Order Control Barrier Functions for Safety-Critical Control with Gaussian Processes, pp. 4026-4031.

Aali, Mohammad; Liu, Jun

14:15-14:30 FrB01.4

Oracle Complexity Reduction for Model-Free LQR: A Stochastic Variance-Reduced Policy Gradient Approach, pp. 4032-4037.

Toso, Leonardo Felipe; Wang, Han; Anderson, James

14:30-14:45 FrB01.5

Detection of Man in the Middle Attacks in Model-Free Reinforcement Learning for the Linear Quadratic Regulator, pp. 4038-4043.

Rani, Rishi; Franceschetti, Massimo

14:45-15:00 FrB01.6

Cooperative Multi-Agent Graph Bandits: UCB Algorithm and Regret Analysis, pp. 4044-4049.

Paschalidis, Phevos; Zhang, Runyu; Li, Na

FrB02 Harbour

Optimal Control I (Regular Session)

Chair: Shishika, Daigo George Mason University

Co-Chair: Borum, Andy Vassar College

13:30-13:45 FrB02.1

Real-Time Feasible Usage of Radial Basis Functions for Representing Unstructured Environments in Optimal Ship Control, pp. 4050-4057.

Tengesdal, Trym; Gros, Sebastien; Johansen, Tor Arne

13:45-14:00 FrB02.2

A Non-Regular Mixed Constrained Problem Involving Sweeping Processes, pp. 4058-4063.

T. Khalil, Nathalie; Cortez, Karla Lorena; Aguiar, A. Pedro

14:00-14:15 FrB02.3

Defending a Static Target Point with a Slow Defender, pp. 4064-4071.

Das, Goutam; Dorothy, Michael; Bell, Zachary I.; Shishika, Daigo

14:15-14:30 FrB02.4

Regret-Optimal Control under Partial Observability, pp. 4072-4077.

Hajar, Joudi; Sabag, Oron; Hassibi, Babak

14:30-14:45 FrB02.5

Optimal Control of Nonlinear Systems with Input and State Constraints Using Koopman Operator, pp. 4078-4083.

Wang, Yujia; Wu, Zhe

14:45-15:00 FrB02.6

Efficient Value Function Upper Bounds for a Class of Constrained Linear Time-Varying Optimal Control Problems, pp. 4084-4089.

Liu, Vincent; Manzie, Chris; Dower, Peter M.

FrB03 Frontenac

Mechatronics II (Invited Session)

Chair: Al Janaideh, Mohammad	University of Guelph
Co-Chair: Mishra, Richa	UNIVERSTIY of TEXAS at DALLAS
Organizer: Al Janaideh, Mohammad	University of Guelph
Organizer: Rakotondrabe, Micky	ENIT Tarbes, INPT, University of Toulouse

13:30-13:45 FrB03.1

Simultaneous Estimation of Differential Surface Parameters with Ultra-Fast Feedback Loop in Scanning Tunneling Microscopy (I), pp. 4090-4095.

Mishra, Richa; Moheimani, S.O. Reza

13:45-14:00 FrB03.2

Position Servo Control Strategy for a Hydraulic Valve-Controlled Cylinder with a Digital Piezo-Actuator (I), pp. 4096-4101.

Zhang, Yunzhi; Rakotondrabe, Micky; Feng, Zhao; Zhu, Yuchuan; Ling, Jie

14:00-14:15 FrB03.3

Output Feedback Control of a Nonlinear Galfenol-Based Actuator for Active Vibration Control Systems (I), pp. 4102-4107.

Clemente, Carmine; Loschiavo, Vincenzo; Davino, Daniele; Monteiro, Giselle; Al Saaideh, Mohammad; Krejci, Pavel; Al Janaideh, Mohammad

14:15-14:30 FrB03.4

Output Feedback Control of a Piezoelectric Robotic Manipulator During the Characterization of an Object Exhibiting Nonlinear Viscoelastic Deformation (I), pp. 4108-4113.

Flores, Gerardo; Rakotondrabe, Micky

14:30-14:45 FrB03.5

Reachability Analysis for Steerable Drifter Systems (I), pp. 4114-4119.

Gaskell, Eric; Tan, Xiaobo

14:45-15:00 FrB03.6

On Precision Motion Control for an Industrial Long-Stroke Motion System with a Nonlinear Micropositioning Actuator (I), pp. 4120-4125.

Al-Rawashdeh, Yazan Mohammad; Al Saaideh, Mohammad; Heertjes, Marcel; Al Janaideh, Mohammad

FrB04 Metro W

Autonomous Planning and Control (Invited Session)

Chair: Zhang, Fumin	Georgia Institute of Technology
Co-Chair: Motee, Nader	Lehigh University
Organizer: Liu, Guangyi	Lehigh University
Organizer: Topcu, Ufuk	The University of Texas at Austin
Organizer: Zhang, Fumin	Georgia Institute of Technology
Organizer: Motee, Nader	Lehigh University

13:30-13:45 FrB04.1

LP-Planning: Linear Control-Based Planning Using Probability Mass Function Measurements (I), pp. 4126-4132.

Kermanshah, Mehdi; Belta, Calin; Tron, Roberto

13:45-14:00 FrB04.2

Time-Robust Path Planning with Piece-Wise Linear Trajectory for Signal Temporal Logic Specifications (I), pp. 4133-4140.

Le, Nhan-Khanh; Noorani, Erfaun; Hirche,

Sandra; Baras, John S.

14:00-14:15 FrB04.3

Community Consensus: Converging Locally Despite Adversaries and Heterogeneous Connectivity (I), pp. 4141-4148.

Gava, Cristina; Vékássy, Áron; Cavorsi, Matthew; Gil, Stephanie; Mallmann-Trenn, Frederik

14:15-14:30 FrB04.4

Investigating the Effectiveness of Reinforcement Learning in Closed-Loop Systems with Time Delays (I), pp. 4149-4154.

Wafi, Moh. Kamalul; Siami, Milad; Sznaier, Mario

14:30-14:45 FrB04.5

Hybrid Zonotope-Based Backward Reachability Analysis for Neural Feedback Systems with Nonlinear Plant Models (I), pp. 4155-4161.

Zhang, Hang; Zhang, Yuhao; Xu, Xiangru

14:45-15:00 FrB04.6

Computing Robust Control Invariant Sets of Nonlinear Systems Using Polynomial Controller Synthesis (I), pp. 4162-4169.

Schäfer, Lukas; Althoff, Matthias

FrB05 Pier 2

Information-Theoretic Control (Regular Session)

Chair: Magbool Jan, Nabil — Indian Institute of Technology Tirupati

Co-Chair: Molloy, Timothy L. — Australian National University

13:30-13:45 FrB05.1

Near-Optimality of Finite-Memory Codes and Reinforcement Learning for Zero-Delay Coding of Markov Sources, pp. 4170-4175.

Cregg, Liam; Alajaji, Fady; Yuksel, Serdar

13:45-14:00 FrB05.2

Active Fixed-Sample-Size Hypothesis Testing Via POMDP Value Function Lipschitz Bounds, pp. 4176-4181.

Molloy, Timothy L.; Nair, Girish N.

14:00-14:15 FrB05.3

Information-Seeking Polynomial NARX Model-Predictive Control through Expected Free Energy Minimization, pp. 4182-4187.

Kouw, Wouter Marco

14:15-14:30 FrB05.4

Deceptive Planning for Resource Allocation, pp. 4188-4195.

Chen, Shenghui; Savas, Yagiz; Karabag, Mustafa O.; Sadler, Brian; Topcu, Ufuk

14:30-14:45 FrB05.5

Optimal Ensemble Control of Matter-Wave Splitting in Bose-Einstein Condensates, pp. 4196-4203.

Paes de Lima, André Luiz; Harter, Andrew; Martin, Michael; Zlotnik, Anatoly

14:45-15:00 FrB05.6

Robust Optimal Sensor Selection Using Information Theoretic Measures, pp. 4204-4209.

Kumar, Manjay; Ankalugari, Rahul Yadav; Magbool Jan, Nabil

FrB06 Queens Quay 1

Decentralized Control (Regular Session)

Chair: Pates, Richard — Lund University

Co-Chair: Huang, Minyi — Carleton University

13:30-13:45 FrB06.1

Exploiting Heterogeneity in the Decentralised Control of Platoons, pp. 4210-4215.

Pates, Richard

13:45-14:00 FrB06.2

Encrypted Decentralized Model Predictive Control of Nonlinear Processes with Input Delays, pp. 4216-4223.

Kadakia, Yash Ashit; Alnajdi, Aisha; Abdullah, Fahim; Christofides, Panagiotis D.

14:00-14:15 FrB06.3

Learning Decentralized Frequency Controllers for Energy Storage Systems, pp. 4224-4229.

Sun, Zexin; Yuan, Zhenyi; Zhao, Changhong; Cortes, Jorge

14:15-14:30 FrB06.4

Mean Field Games on Dense and Sparse Networks: The Graphexon MFG Equations, pp. 4230-4235.

Caines, Peter E.; Huang, Minyi

14:30-14:45 FrB06.5

A Distributed Buffering Drift-Plus-Penalty Algorithm for Coupling Constrained Optimization, pp. 4236-4241.

Wang, Dandan; Zhu, Daokuan; Ou, Zichong; Lu, Jie

FrB07 Queens Quay 2

Modeling and Control of Alternative Powertrains and Mobility Systems (Invited Session)

Chair: Rajakumar Deshpande, Shreshta	Southwest Research Institute
Co-Chair: Gupta, Shobhit	General Motors
Organizer: Gupta, Shobhit	General Motors
Organizer: Kang, Jun-Mo	General Motors Holdings LLC
Organizer: Rajakumar Deshpande, Shreshta	Southwest Research Institute
Organizer: Nazari, Shima	UC Davis

13:30-13:45 FrB07.1

LQTI EGR Rate and Boost Pressure Control of a Diesel Engine Assisted by an EBoost (I), pp. 4242-4247.

Gamache, Corey; Zhu, Guoming

13:45-14:00 FrB07.2

Scalable Data Driven Models for Control of Multi-Fuel Compression Ignition Engine (I), pp. 4248-4253.

Govind Raju, Sathya Aswath; Sun, Zongxuan; Kim, Kenneth; Kweon, Chol-Bum

14:00-14:15 FrB07.3

Vehicle Speed Profile Optimization for Fuel Efficient Eco-Driving Via Koopman Linear Predictor and Model Predictive Control (I), pp. 4254-4261.

Nugroho, Sebastian Adi; Chellapandi, Vishnu Pandi; Borhan, Hoseinali

14:15-14:30 FrB07.4

LQ Control of Traffic Flow Models Via Variable Speed Limits (I), pp. 4262-4267.

Block, Brian; Stockar, Stephanie

14:30-14:45 FrB07.5

Model Predictive Control of Diesel Engine Emissions Based on Neural Network Modeling, pp. 4268-4274.

Zhang, Jiadi; Li, Xiao; Kolmanovsky, Ilya V.; Tsutsumi, Munechika; Nakada, Hayato

14:45-15:00 FrB07.6

Nexus Cognizant Pricing of Workplace Electric Vehicle Charging, pp. 4275-4282.

Mou, Minghao; Qian, Sean; Qin, Junjie

FrB08 Bay

Control Applications I (Regular Session)

Chair: Xu, Zhe	Arizona State University
Co-Chair: Beijen, Michiel	Demcon

13:30-13:45 FrB08.1

Performance Analysis of Moving Average Filter Using Allan Variance, pp. 4283-4288.

Maddipatla, Srivenkata Satya Prasad; Brennan, Sean

13:45-14:00 FrB08.2

Distributed Differentially Private Control Synthesis for Multi-Agent Systems with Metric Temporal Logic Specifications, pp. 4289-4295.

Baharisangari, Nasim; Saravanane, Narendhiran; Xu, Zhe

14:00-14:15 FrB08.3

Hybrid Control of a Variable-Speed Peristaltic Pump, pp. 4296-4301.

Beijen, Michiel; Tijman op Smeijers, Thijs; Boerrigter, Gijs; van den Eijnden, Sebastiaan

14:15-14:30 FrB08.4

Optimal Control of Material Micro-Structures, pp. 4302-4307.

Sharma, Aayushman; Mao, Zirui; Yang, Haiying; Chakravorty, Suman; Demkowicz, Michael; Kalathil, Dileep

14:30-14:45 FrB08.5

An Efficiency Scanning Strategy Based on Online Smoothing Variable-Speed for AFM with a Rotating Stage, pp. 4308-4313.

Chen, Huang-Chih; Peng, Sheng-Wei;

Chou, Ting-An; Fu, Li-Chen

14:45-15:00 FrB08.6

Safe Extremum Seeking Applications in Particle Accelerators, pp. 4314-4319.

Williams, Alan; Scheinker, Alexander; Huang, En-Chuan; Taylor, Charles; Krstic, Miroslav

FrB09 Dockside 1

Recent Advancements in Data-Driven Decision-Making and Control (Invited Session)

Chair: Drgona, Jan	Pacific Northwest National Laboratory
Co-Chair: Masti, Daniele	IMT School for Advanced Studies Lucca
Organizer: Masti, Daniele	Gran Sasso Science Institute
Organizer: Fabiani, Filippo	IMT School for Advanced Studies Lucca
Organizer: Breschi, Valentina	Eindhoven University of Technology
Organizer: Drgona, Jan	Pacific Northwest National Laboratory

13:30-13:45 FrB09.1

A Data-Driven Formulation of the Maximal Admissible Set and the Data-Enabled Reference Governor (I), pp. 4320-4325.

Ossareh, Hamid

13:45-14:00 FrB09.2

Data-Driven System Interconnections and a Novel Data-Enabled Internal Model Control (I), pp. 4326-4332.

Pedari, Yasaman; Lee, Jaeho; Eun, Yongsoon; Ossareh, Hamid

14:00-14:15 FrB09.3

A Parametric Bayesian Optimization Framework for Batch Dynamical Systems (I), pp. 4333-4338.

Thompson, Jaron; MacKinnon, Lloyd; Venturelli, Ophelia; Zavala, Victor M.

14:15-14:30 FrB09.4

Line-Of-Sight Visual Target Tracking Via Particle-Based Belief Propagation (I), pp. 4339-4344.

Lin, Tony; Gagvani, Manav; Lindstrom, Sean; Sofge, Don; Zhang, Fumin

14:30-14:45 FrB09.5

Pi-ORFit: One-Pass Learning with Bregman Projection (I), pp. 4345-4352.

Cho, Namhoon; Min, Youngjae; Shin, Hyo-Sang; Azizan, Navid

14:45-15:00 FrB09.6

Active Perception Using Neural Radiance Fields (I), pp. 4353-4358.

He, Siming; Hsu, Christopher; Ong, Dexter; Shao, Yifei; Chaudhari, Pratik

FrB10 Dockside 2

Adaptive Systems (Regular Session)

Chair: Dogan, Kadriye	Embry-Riddle Aeronautical University
Co-Chair: Anubi, Olugbenga Moses	Florida State University

13:30-13:45 FrB10.1

Fractional-Order Integral Neural-Adaptive Control of Nonlinear Input-Affine Systems, pp. 4359-4364.

Doctolero, Samuel; Westwick, David

13:45-14:00 FrB10.2

Passive Stability and Adaptive Control of Teleoperated System Using Wave Variables and Predictor Techniques, pp. 4365-4371.

Rajarajan, Naveen Kumar; Mudhangulla, Sridhar; Anubi, Olugbenga Moses

14:00-14:15 FrB10.3

Adaptive Control Allocation for Uncertain Systems with Unknown Effector Degradation, pp. 4372-4377.

Sarioglu, N. Eren; Dogan, Kadriye

14:15-14:30 FrB10.4

Adaptive Kalman Filtering Developed from Recursive Least Squares Forgetting Algorithms, pp. 4378-4383.

Lai, Brian; Bernstein, Dennis S.

14:30-14:45 FrB10.5

DATrack: MCMOT Based on Feature Decoupling and Adaptive Motion Association, pp. 4384-4389.

Cheng, Ao; Wang, Qiang; Liu, Feiyang; Li, Xinyv

14:45-15:00 FrB10.6

ArUco Based Reference Shaping for Real-Time Precision Motion Control for Suspended Payloads, pp. 4390-4395.

Stein, Adrian; Vexler, David; Singh, Tarunraj

FrB11 Dockside 3

Spreading Processes in Complex Networks: Analysis, Control and Observability (Invited Session)

Chair: Pare, Philip E.	Purdue University
Co-Chair: Uribe, Cesar A.	Rice University
Organizer: Gracy, Sebin	South Dakota School of Mines and Technology
Organizer: Uribe, Cesar A.	Rice University
Organizer: Pare, Philip E.	Purdue University
Organizer: Sontag, Eduardo	Northeastern University

13:30-13:45 FrB11.1

Data-Driven Design of Complex Network Structures to Promote Synchronization (I), pp. 4396-4401.

Coraggio, Marco; di Bernardo, Mario

13:45-14:00 FrB11.2

Predator-Swarm-Guide Dynamics: A Hybrid Approach to Crowd Modeling and Guidance in Mass Shooting Scenarios (I), pp. 4402-4408.

Darabi, Atefe; Montazeri Hedesh, Hamidreza; Siami, Milad; Sznaier, Mario

14:00-14:15 FrB11.3

Competitive Networked Bivirus SIS Spread Over Hypergraphs (I), pp. 4409-4415.

Gracy, Sebin; Anderson, Brian D.O.; Ye, Mengbin; Uribe, Cesar A.

14:15-14:30 FrB11.4

A Lyapunov Approach to Stochastic Interaction Dynamics Over Large-Scale Networks (I), pp. 4416-4421.

Como, Giacomo; Fagnani, Fabio; Zampieri, Sandro

14:30-14:45 FrB11.5

Differentially Private Computation of Basic Reproduction Numbers in Networked Epidemic Models (I), pp. 4422-4427.

Chen, Bo; She, Baike; Hawkins, Calvin; Benvenuti, Alexander; Fallin, Brandon; Pare, Philip E.; Hale, Matthew

14:45-15:00 FrB11.6

Active Risk Aversion in SIS Epidemics on Networks (I), pp. 4428-4433.

Bizyaeva, Anastasia; Ordorica Arango, Marcela; Zhou, Yunxiu; Levin, Simon; Leonard, Naomi Ehrich

FrB12 Dockside 9

Chemical Process Control (Regular Session)

Chair: Singh, Ravendra	Rutgers
Co-Chair: Shardt, Yuri	TU Ilmenau

13:30-13:45 FrB12.1

Data-Driven Modeling and Control of Semicontinuous Distillation Process, pp. 4434-4439.

Aenugula, Sakthi Prasanth; Chandrasekar, Aswin; Mhaskar, Prashant; Adams, Thomas

13:45-14:00 FrB12.2

Enhancing Protein Crystal Purity through Adaptive Kinetic Monte Carlo Modeling and Control of Surface Morphology, pp. 4440-4445.

Nagpal, Satchit; Kwon, Joseph

14:00-14:15 FrB12.3

A Compact Design for Soft Sensors Based on Information-Bottleneck Theory, pp. 4446-4451.

Gao, Xinrui; Zhao, Jiarui; Shardt, Yuri

14:15-14:30 FrB12.4

A Two-Tier Encrypted Control Architecture for Enhanced Cybersecurity of Nonlinear Processes, pp. 4452-4459.

Kadakia, Yash Ashit; Suryavanshi, Atharva Vijay; Alnajdi, Aisha; Abdullah, Fahim; Christofides, Panagiotis D.

14:30-14:45 FrB12.5

Machine Learning-Based Initialization of Generalized Benders Decomposition for

Mixed Integer Model Predictive Control, pp. 4460-4465.

Mitrai, Ilias; Daoutidis, Prodromos

14:45-15:00 FrB12.6

Optimal Scheduling and Open-Loop Control of Network Batch Processes under Variable Processing Times Using Generalized Benders Decomposition, pp. 4466-4471.

Liñán, David A.; Reynoso Donzelli, Simone; Ricardez-Sandoval, Luis

FrB13 Richmond

Manufacturing and Precision Mechatronic Systems (Regular Session)

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

13:30-13:45 FrB13.1

Predictive Modeling of Human Fatigue in a Manufacturing-Like Setting, pp. 4472-4478.

Rafter, Abigail; Barton, Kira; Tilbury, Dawn M.

13:45-14:00 FrB13.2

Control Barrier Functionals for Safety-Critical Control of Registration Accuracy in Roll-To-Roll Printing Systems, pp. 4479-4484.

Chen, Zhiyi; Orosz, Gabor; Ni, Jun

14:00-14:15 FrB13.3

Predictable Multi-Core Implementation of Multi-Rate Sensor Fusion for High-Precision Positioning Systems, pp. 4485-4492.

Jugade, Chaitanya; Mohamed, Sajid; Goswami, Dip; Nelson, Andrew; Van der veen, Gijs; Goossens, Kees

14:15-14:30 FrB13.4

Optimal Efficiency Controller Design of Pumping Systems, pp. 4493-4498.

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

14:30-14:45 FrB13.5

Voltage Waveform Optimization through Data-Driven Modeling in Electrohydrodynamic Jet Printing, pp. 4499-4505.

Hawa, Angelo; Barton, Kira

14:45-15:00 FrB13.6

Modeling and Control of Continuous Countercurrent Tangential Chromatography, pp. 4506-4511.

Dighe, Anish Vikas; Lu, Amos; Braatz, Richard D.

FrB14 Wellington

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

On the Fisher Identifiability of Coupled Transport Processes in Animal Hypoxia Experiments (I), pp. 4512-4517.

Abdelazim, Eman; Fathy, Hosam K.

13:45-14:00 FrB14.2

Neuromechanical Model-Free Epistemic Risk Guided Exploration (NeuroMERGE) for Safe Autonomy in Human-Robot Interaction (I), pp. 4518-4523.

Baskaran, Avinash; Basyal, Sujata; Allen, Brendon C.; Rose, Chad

14:00-14:15 FrB14.3

Intersection Point-Based Analysis of Neural Balance Control Strategies by Parkinson's Patients During Quiet Stance (I), pp. 4524-4529.

Sreenivasan, Gayatri; Zhu, Chunchu; Yi, Jingang

14:15-14:30 FrB14.4

Neural Fiber Activation in Unipolar vs Bipolar

Deep Brain Stimulation (I), pp. 4530-4535.

Frigge, Anna Franziska; Medvedev, Alexander V.; Jiltsova, Elena; Nyholm, Dag

14:30-14:45 FrB14.5

Closed-Loop Multimodal Neuromodulation of Vagus Nerve for Control of Heart Rate (I), pp. 4536-4541.

Bender, Shane; Green, David; Kilgore, Kevin; Bhadra, Niloy; Ardell, Jeffery; Vrabec, Tina

14:45-15:00 FrB14.6

Guaranteeing Safety of Patients under Mechanical Ventilation, pp. 4542-4547.

Hosseinzadeh, Mehdi

FrB15 Yonge

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

13:30-13:45 FrB15.1

Viability under Degraded Control Authority (I), pp. 4548-4553.

El-Kebir, Hamza; Berlin, Richard; Bentsman, Joseph; Ornik, Melkior

13:45-14:00 FrB15.2

Representation of PDE Systems with Delay and Stability Analysis Using Convex Optimization (I), pp. 4554-4559.

Jagt, Declan S.; Peet, Matthew M.

14:00-14:15 FrB15.3

Neumann Boundary Control of the Wave Equation Via Linear Quadratic Regulation (I), pp. 4560-4565.

Krener, Arthur J

14:15-14:30 FrB15.4

Adaptive Cluster-Dynamic Mode Decomposition with Application to the Burgers' Equation (I), pp. 4566-4571.

Wu, Tumin; Wilson, Dan; Djouadi, Seddik, M.

14:30-14:45 FrB15.5

Linear-Quadratic Control Problem on a Finite-Horizon for a Class of Differential-Algebraic Equations (I), pp. 4572-4578.

Alalabi, Ala'; Morris, Kirsten

14:45-15:00 FrB15.6

Strict Dissipativity and Turnpike for LQ Optimal Control Problems with Possibly Boundary Reference (I), pp. 4579-4584.

Li, Zhuqing; Guglielmi, Roberto

FrB16 Dockside 4

Modeling and Control for Thermal Management Systems (Invited Session)

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: Chakrabarty, Ankush	Mitsubishi Electric Research Laboratories (MERL)
Organizer: Drgona, Jan	Pacific Northwest National Laboratory
Organizer: Blizard, Audrey	The Ohio State University

13:30-13:45 FrB16.1

Stochastic Model Predictive Control for Electric Vehicles Thermal Management, pp. 4585-4590.

Hu, Qiuhao; Amini, Mohammad Reza; Kolmanovsky, Ilya V.; Sun, Jing

13:45-14:00 FrB16.2

Experimental Validation of Control-Oriented Dynamic Modeling of Pumped Two-Phase Cooling Systems (I), pp. 4591-4598.

Shaikh, Juned; Koeln, Justin

14:00-14:15 FrB16.3

A Multi-Agent Approach to Safe Control of Energy Systems Using Control Barrier Functions (I), pp. 4599-4604.

Marvi, Zahra; Alleyne, Andrew G.

14:15-14:30 FrB16.4

Understanding the Role of Thermal Energy Storage Location in the Optimal Performance and Operation of a District Cooling Network (I), pp. 4605-4611.

Andujar Lugo, Frank; Alleyne, Andrew G.

14:30-14:45 FrB16.5

Physics-Constrained Deep Kalman Filters for Estimating Vapor Compression System States (I), pp. 4612-4617.

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

14:45-15:00 FrB16.6

Smooth Sliding Control of Van Der Pol Oscillators with a Single Input: Application to Micro-Thermal-Fluid Cooling Systems, pp. 4618-4623.

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

FrB17 Dockside 5

Modeling and Identification II (Regular Session)

Chair: Kim, Jin Sung — Hanyang University

Co-Chair: Shen, Minghao — University of Michigan

13:30-13:45 FrB17.1

Optimal Control for Antivirus Routing in Epidemiological-Based Heterogeneous Computer Network Clusters, pp. 4624-4630.

Wang, Shuangge; He, Zhilin; Xu, Zihao; Haskell, Cymra; Krishnamachari, Bhaskar

13:45-14:00 FrB17.2

Uncertainty Quantification of Autoencoder-Based Koopman Operator, pp. 4631-4636.

Kim, Jin Sung; Quan, Yingshuai; Chung, Chung Choo

14:00-14:15 FrB17.3

A Model for Multi-Agent Heterogeneous Interaction Problems, pp. 4637-4644.

Hsu, Christopher; Haile, Mulugeta; Chaudhari, Pratik

14:15-14:30 FrB17.4

A Harmonic Framework for the Identification of Linear Time-Periodic Systems, pp. 4645-4650.

Vernerey, Flora; Riedinger, Pierre; Iannelli, Andrea; Daafouz, Jamal

14:30-14:45 FrB17.5

Control-Oriented 2D Thermal Modelling of Cylindrical Battery Cells for Optimal Tab and Surface Cooling, pp. 4651-4656.

Peprah, Godwin; Wik, Torsten; Huang, Yicun; Faisal, Altaf; Zou, Changfu

FrB18 Dockside 6

Hybrid Systems (Regular Session)

Chair: Trivedi, Ashutosh — University of Colorado Boulder

Co-Chair: Phillips, Sean — Air Force Research Laboratory

13:30-13:45 FrB18.1

Falsification Via Barrier Certificates, pp. 4657-4662.

Murali, Vishnu; Trivedi, Ashutosh; Zamani, Majid

13:45-14:00 FrB18.2

A Switched Reference Governor for High Performance Trajectory Tracking Control under State and Input Constraints, pp. 4663-4668.

Wang, Nan; Sanfelice, Ricardo G.; Di Cairano, Stefano

14:00-14:15 FrB18.3

Robust Hybrid Wide-Area Damping Control for Power Systems with Communication Errors, pp. 4669-4674.

Copp, David A.; Phillips, Sean

14:15-14:30 FrB18.4

Parameter Estimation for Hybrid Dynamical Systems with Delayed Jump Detection, pp. 4675-4680.

Johnson, Ryan S.; Sanfelice, Ricardo G.

14:30-14:45 FrB18.5

Dynamic Event-Triggered Control for LTI

Systems with Asynchronous Input/Output Transmissions, pp. 4681-4686.

Abdelrahim, Mahmoud; Almakhles, Dhafer J

14:45-15:00 FrB18.6

Fault-Tolerant Control of Hybrid UAV Using Weighted Control Allocation Scheme, pp. 4687-4692.

Ijaz, Salman; Javaid, Umair; Nasr, Ahmed; Sun, Donglei

FrB19 Pier 7

Stochastic Systems and Control I (Regular Session)

Chair: Hsu, Shun-Pin — National Chung-Hsing University

Co-Chair: Halder, Abhishek — Iowa State University

13:30-13:45 FrB19.1

Path Structured Multimarginal Schrödinger Bridge for Probabilistic Learning of Hardware Resource Usage by Control Software, pp. 4693-4698.

Bondar, Georgiy Antonovich; Gifford, Robert; Phan, Linh Thi Xuan; Halder, Abhishek

13:45-14:00 FrB19.2

Consensus Sets Based on Sarymsakov Matrices, pp. 4699-4704.

Hsu, Shun-Pin

14:00-14:15 FrB19.3

Distributionally Robust Output-Feedback Control of Markov Jump Linear Systems, pp. 4705-4710.

Mark, Christoph; Pazzaglia, Paolo; Schmidt, Kevin

14:15-14:30 FrB19.4

Turing-Type Instabilities and Pattern Formation Induced by Saturation Effects and Randomness in Nonlinear, Diffusive Epidemic Spread, pp. 4711-4716.

Singh, Aman Kumar; Boltz, Noelle; Kumar, Manish; Ramakrishnan, Subramanian

14:30-14:45 FrB19.5

Guaranteed Region of Attraction of Stochastic Nonlinear Quadratic Systems, pp. 4717-4722.

Tartaglione, Gaetano; Montefusco, Francesco; Ariola, Marco; Cosentino, Carlo; Merola, Alessio; Amato, Francesco

14:45-15:00 FrB19.6

On the Contraction Coefficient of the Schrödinger Bridge for Stochastic Linear Systems, pp. 4723-4728.

Teter, Alexis; Chen, Yongxin; Halder, Abhishek

FrB20 Pier 8

Observers for Nonlinear Systems (Regular Session)

Chair: Bainier, Gustave — Université De Lorraine

Co-Chair: Raïssi, Tarek — Conservatoire National Des Arts Et Métiers

13:30-13:45 FrB20.1

Confidently Incorrect: Nonlinear Observers with Online Error Bounds, pp. 4729-4734.

Bunton, Jonathan; Tabuada, Paulo

13:45-14:00 FrB20.2

Moving-Horizon Estimators for Hyperbolic and Parabolic PDEs in 1-D, pp. 4735-4740.

Bhan, Luke; Shi, Yuanyuan; Karafyllis, Iasson; Krstic, Miroslav; Rawlings, James B.

14:00-14:15 FrB20.3

Interval State Estimation Based on Ellipsoid for Wastewater Treatment Bioprocess, pp. 4741-4746.

Zhou, Meng; Wu, Yan; Wang, Jing; Xue, Tonglai; Raïssi, Tarek

14:15-14:30 FrB20.4

Sampled Data Radial Basis Function Neural Network Observer Design for Nonlinear Vehicle Dynamics, pp. 4747-4752.

Abdl Ghani, Hasan; Ahmed Ali, Sofiane; Laghmara, Hind; Ainouz, Samia; Khemmar, Redouane

14:30-14:45 FrB20.5

Bezier Controllers and Observers for Takagi-Sugeno Models, pp. 4753-4758.

Bainier, Gustave; Marx, Benoit; Ponsart, Jean-Christophe

14:45-15:00 FrB20.6

Observer-Based Stabilization of Lipschitz Nonlinear Systems by Using a New Matrix-Multiplier Based LMI Approach, pp. 4759-4764.

Mohite, Shivaraj; Alma, Marouane; Zemouche, Ali

FrB21 Pier 3

Lyapunov Methods (Regular Session)

Chair: Sforni, Lorenzo — Alma Mater Studiorum - Università Di Bologna

Co-Chair: Poveda, Jorge I. — University of California, San Diego

13:30-13:45 FrB21.1

Receding Horizon CBF-Based Multi-Layer Controllers for Safe Trajectory Generation, pp. 4765-4770.

Sforni, Lorenzo; Notarstefano, Giuseppe; Ames, Aaron D.

13:45-14:00 FrB21.2

Characterizing Smooth Safety Filters Via the Implicit Function Theorem, pp. 4771-4776.

Cohen, Max; Ong, Pio; Bahati, Gilbert; Ames, Aaron D.

14:00-14:15 FrB21.3

Stabilization under Arbitrary Tight and One Sided Control Constraints: A Variational Equations Approach, pp. 4777-4782.

Kolmanovsky, Ilya V.; Garone, Emanuele

14:15-14:30 FrB21.4

On Fixed-Time Stability for a Class of Singularly Perturbed Systems Using Composite Lyapunov Functions, pp. 4783-4788.

Tang, Michael; Krstic, Miroslav; Poveda, Jorge I.

14:30-14:45 FrB21.5

Compositionally Verifiable Vector Neural Lyapunov Functions for Stability Analysis of Interconnected Nonlinear Systems, pp. 4789-4794.

Liu, Jun; Meng, Yiming; Fitzsimmons, Maxwell; Zhou, Ruikun

14:45-15:00 FrB21.6

Optimal Recursive Terminal Sliding-Mode Control Using Super-Twisting Algorithm for Improving High Efficiency and Reliability of Pump Systems, pp. 4795-4800.

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

FrC01 Metro E/C

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

Chair: Koscielniak, Shane — TRIUMF

Co-Chair: Bristow, Douglas A. — Missouri University of Science & Technology

Organizer: Bristow, Douglas A. — Missouri University of Science & Technology

Organizer: Koscielniak, Shane — TRIUMF

15:30-15:45 FrC01.1

Observations on Causal Iterative-Learning-Control & Transients, pp. 4801-4806.

Koscielniak, Shane

15:45-16:00 FrC01.2

Observations on Noncausal Iterative-Learning-Control & Transients, pp. 4807-4812.

Koscielniak, Shane

16:00-16:15 FrC01.3

Constrained Reinforcement Learning for Building Demand Response, pp. 4813-4818.

Sanchez, Jerson; Cai, Jie

16:15-16:30 FrC01.4

Iterative Learning Control of Direct Write Additive Manufacturing Using Online Process Monitoring (I), pp. 4819-4824.

Urbanski, Christopher J.; Alleyne, Andrew G.

16:30-16:45 FrC01.5

Artificial Neural Network Based ILC with Application to Stroke Rehabilitation (I), pp. 4825-4830.

Sun, Xiaoru; Freeman, Christopher T.

16:45-17:00 FrC01.6

L Bounds for Transient Growth in Repetitive and Iterative Learning Control Systems (I), pp. 4831-4837.

Bristow, Douglas A.; Singler, John

FrC02	Harbour
Optimal Control II (Regular Session)	
Chair: Borum, Andy	Vassar College
Co-Chair: Gurpegui, Alba	Lund University

15:30-15:45 FrC02.1

Poisoning Actuation Attacks against the Learning of an Optimal Controller, pp. 4838-4843.

Fotiadis, Filippos; Kanellopoulos, Aris; Vamvoudakis, Kyriakos G.; Hugues, Jerome

15:45-16:00 FrC02.2

Pointwise Sufficient Conditions for One-Dimensional Optimal Control Problems, pp. 4844-4849.

Borum, Andy; Bretl, Timothy

16:00-16:15 FrC02.3

Modeling Model Predictive Control: A Category Theoretic Framework for Multistage Control Problems, pp. 4850-4857.

Hanks, Tyler; She, Baike; Patterson, Evan; Hale, Matthew; Klawonn, Matthew; Fairbanks, James

16:15-16:30 FrC02.4

Minimax Linear Optimal Control of Positive Systems, pp. 4858-4863.

Gurpegui, Alba; Tegling, Emma; Rantzer, Anders

16:30-16:45 FrC02.5

Privacy-Preserving Cloud Computation of Algebraic Riccati Equations, pp. 4864-4869.

Malladi, Surya; Monshizadeh, Nima

FrC03	Frontenac
Robotics II (Regular Session)	
Chair: Sharma, Nitin	North Carolina State University
Co-Chair: Hashim, Hashim A	Carleton University

15:30-15:45 FrC03.1

Dynamic Active Subspaces for Model Predictive Allocation in Over-Actuated Systems, pp. 4870-4875.

Singh, Mayank; Lambeth, Krysten; Iyer, Ashwin; Sharma, Nitin

15:45-16:00 FrC03.2

Adaptive Backstepping and Non-Singular Sliding Mode Control for Quadrotor UAVs with Unknown Time-Varying Uncertainties, pp. 4876-4882.

Shevidi, Arezo; Hashim, Hashim A

16:00-16:15 FrC03.3

Optimized Control Invariance Conditions for Uncertain Input-Constrained Nonlinear Control Systems, pp. 4883-4888.

Brunke, Lukas; Zhou, Siqi; Che, Mingxuan; Schoellig, Angela P

16:15-16:30 FrC03.4

Human Torque Estimation for an LMI-Based Convex Control Rehabilitation Strategy Using Assistive Robots, pp. 4889-4894.

Ibarra, Jorge; Moussa, Kaouther; Lauber, Jimmy

16:30-16:45 FrC03.5

Optimizing Energy Efficiency with Configuration Constraints for AMR Trajectory Planning, pp. 4895-4900.

Chu, Jian; Huang, Joey; Bakshi, Soovadeep; Zhu, Yongye; Ohman, Ethan; Chen, Dongmei

16:45-17:00 FrC03.6

Trajectory Tracking and Disturbance Rejection for Euler-Lagrange Systems with High-Order Actuator Dynamics, pp. 4901-4906.

He, Changran; Huang, Jie

FrC04	Metro W
Autonomous Vehicles (Regular Session)	
Chair: Ramadan, Mohammad	Argonne National Laboratory
Co-Chair: Zemouche, Ali	CRAN UMR CNRS 7039 & Université De Lorraine

15:30-15:45 FrC04.1

Developing Driving Strategies Efficiently: A Skill-Based Hierarchical Reinforcement Learning Approach, pp. 4907-4912.

Gurses, Yigit; Buyukdemirci, Kaan; Yildiz, Yildiray

15:45-16:00 FrC04.2

RNN Controller for Lane-Keeping Systems with Robustness and Safety Verification, pp. 4913-4918.

Quan, Yingshuai; Kim, Jin Sung; Chung, Chung Choo

16:00-16:15 FrC04.3

Radar Sensor-Based Longitudinal Motion Estimation by Using a Generalized High-Gain Observer, pp. 4919-4923.

Bessafa, Hichem; Belkhatir, Zehor; Delattre, Cedric; Khemmar, Redouane; Zemouche, Ali; Rajamani, Rajesh

16:15-16:30 FrC04.4

A Control Approach for Nonlinear Stochastic State Uncertain Systems with Probabilistic Safety Guarantees, pp. 4924-4929.

Ramadan, Mohammad; Alsuwaidan, Mohammad; Atallah, Ahmed; Herbert, Sylvia

16:30-16:45 FrC04.5

Trajectory-Tracking Hybrid Prescribed-Time Control for Wheeled Mobile Robots with Disturbances, pp. 4930-4935.

Rodriguez-Arellano, Jesus Abraham; Miranda Colorado, Roger; Aguilar, Luis T.

16:45-17:00 FrC04.6

Hierarchical Motion Planning and Offline Robust Model Predictive Control for Autonomous Vehicles, pp. 4936-4941.

Duy Nguyen, Hung; Vu, Minh Nhat; Nam, Nguyen Ngoc; Han, Kyoungseok

FrC05 Pier 2

Computational Methods (Regular Session)

Chair: Hafstein, Sigurdur — University of Iceland

Co-Chair: Yedavalli, Rama K. — Ohio State Univ

15:30-15:45 FrC05.1

Lyapunov Functions for Switched Linear Systems: Proof of Convergence for an LP Computational Approach, pp. 4942-4947.

Hafstein, Sigurdur

15:45-16:00 FrC05.2

A Necessary and Sufficient Condition for the Existence of Static Output Feedback Stabilization Gain Via Non-Lyapunov, Null Plant Matrix (NPM) Approach, pp. 4948-4953.

Yedavalli, Rama K.

16:00-16:15 FrC05.3

Construction of Robust NCR for Input-Constrained Discrete Nonlinear Systems Using Backward Reachability, pp. 4954-4959.

Kothyari, Ashish; Bannerjee, Addyay; Mhaskar, Prashant

16:15-16:30 FrC05.4

Sensor Placement for Flapping Wing Model Using Stochastic Observability Gramians, pp. 4960-4966.

Boyacioglu, Burak; Babaei, Mahnoush; Mamo, Amanuel; Bergbreiter, Sarah; Daniel, Thomas; Morgansen, Kristi A.

16:30-16:45 FrC05.5

A Computation Governor for ADMM-Based MPC with Constraint Satisfaction and Setpoint Tracking, pp. 4967-4973.

van Leeuwen, Steven; Kolmanovsky, Ilya V.

16:45-17:00 FrC05.6

A Computational Framework for the Numerical Solution of Optimal Control Problems Governed by Partial Differential Equations, pp. 4974-4979.

Davies, Alexander; Dennis, Miriam; Rao, Anil V.

FrC06 Queens Quay 1

Large-Scale Systems (Regular Session)

Chair: Boker, Almuatazbellah — Virginia Tech

Co-Chair: Song, Ziyou — University of Michigan, Ann Arbor

15:30-15:45 FrC06.1

Efficient Near-Optimal Control of Large-Size Second-Order Linear Time-Varying Systems, pp. 4980-4985.

Rustagi, Vishvendra; Baddam, Vasanth Reddy; Boker, Almuatazbellah; Sultan, Cornel; Eldardiry, Hoda

15:45-16:00 FrC06.2

A Scalable Charging Algorithm for

Heterogeneous EV Fleets Based on Clustering and Learning Methods, pp. 4986-4991.

Xu, Liangcai; Gu, Xubo; Song, Ziyou

16:00-16:15 FrC06.3

Recognition of an Unknown Linear Ensemble by Its Aggregated Measurements, pp. 4992-4997.

Cheng, Gong; Miao, Wei

16:15-16:30 FrC06.4

Exploring Non-Submodular Scheduling for Large-Scale Sensor Networks, pp. 4998-5003.

Vafaee, Reza; Siami, Milad

16:30-16:45 FrC06.5

Data-Driven Moment-Based Control of Linear Ensemble Systems, pp. 5004-5009.

Vu, Minh; Singhal, Bharat; Li, Jr-Shin; Zeng, Shen

16:45-17:00 FrC06.6

Mean Field Limits for Discrete-Time Dynamical Systems Via Kernel Mean Embeddings, pp. 5010-5015.

Fiedler, Christian; Herty, Michael; Trimpe, Sebastian

FrC07 Queens Quay 2

Automotive Control (Regular Session)

Chair: Benciolini, Tommaso — Technical University of Munich

Co-Chair: Ghasemi, Masood — Worcester Polytechnic Institute

15:30-15:45 FrC07.1

Mobility Control of an In-Wheel-Motor Electric Vehicle in Severe Off-Road Terrain Conditions, pp. 5016-5023.

Ghasemi, Masood; Vantsevich, Vladimir; Moradi, Lee; Gorsich, David; Cole, Michael

15:45-16:00 FrC07.2

Power Losses Aware Nonlinear Model Predictive Control Design for Active Cell Balancing, pp. 5024-5029.

Uppal, Ali Arshad; Syed, Bilal Javed; Ahmed, Qadeer

16:00-16:15 FrC07.3

Stability Analysis and Control Design for Automated Vehicles Based on Data-Aided Model Augmentation, pp. 5030-5035.

Nemeth, Balazs; Lelkó, Attila; Hegedus, Tamas; Gaspar, Peter

16:15-16:30 FrC07.4

Weakly Coupled Systems of Eikonal Equations in Path-Planning Problems, pp. 5036-5041.

Teresa, Maria; Czuprynski, Kenneth; Zikatanov, Ludmil

16:30-16:45 FrC07.5

Combining Belief Function Theory and Stochastic Model Predictive Control for Multi-Modal Uncertainty in Autonomous Driving, pp. 5042-5048.

Benciolini, Tommaso; Yan, Yuntian; Wollherr, Dirk; Leibold, Marion

16:45-17:00 FrC07.6

Distributed Road-Map Monitoring Using Onboard Sensors, pp. 5049-5054.

Zhang, Yanyu; Greiff, Marcus Carl; Ren, Wei; Berntorp, Karl

FrC08 Bay

Control Applications II (Regular Session)

Chair: Parkinson, Christian — University of Arizona

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

15:30-15:45 FrC08.1

An Efficient Semi-Real-Time Algorithm for Path Planning in the Hamilton-Jacobi Formulation, pp. 5055-5060.

Parkinson, Christian; Polage, Kyle

15:45-16:00 FrC08.2

Intra-Cavity Control of an Adaptive Thin-Disk Laser with Multiple Pneumatically Actuated Deformable Mirrors, pp. 5061-5066.

Heining, André; Esser, Stefan; Mrzyglod, Stephanie; Abdou Ahmed, Marwan; Graf, Thomas; Sawodny, Oliver

16:00-16:15 FrC08.3

An Agent-Based Behavioral Change Model with Behavioral Intervention Control Techniques, pp. 5067-5074.

Fernandes, Keegan; Davison, Daniel E.;

Wang, David

16:15-16:30 FrC08.4

Multi-Population Mean Field Games with Multiple Major Players: Application to Carbon Emission Regulations, pp. 5075-5081.

Dayanikli, Gokce; Lauriere, Mathieu

16:30-16:45 FrC08.5

Extremum Seeking Control Techniques for Antenna Pointing, pp. 5082-5087.

Shore, Scott; Lane, Steven; Danielson, Claus

16:45-17:00 FrC08.6

Design of an Easy-To-Implement Fixed-Time Stable Sliding Mode Control, pp. 5088-5093.

Labbadi, Moussa; Incremona, Gian Paolo; Ferrara, Antonella

FrC09 Dockside 1

Data-Driven Modeling and Control (Regular Session)

Chair: Zinage, Vrushabh — University of Texas at Austin

Co-Chair: Seiler, Peter — University of Michigan, Ann Arbor

15:30-15:45 FrC09.1

Data-Driven Control of Adaptive Cruise Control Systems Using Differential Flatness and Gaussian Processes, pp. 5094-5099.

Jeloka, Bhavini; Nicolau, Florentina; Saoud, Adnane; Banavar, Ravi N.

15:45-16:00 FrC09.2

Big Data-Driven Predictive Control Using Multi-View Clustering, pp. 5100-5105.

Han, Shuangyu; Yan, Yitao; Bao, Jie; Huang, Biao

16:00-16:15 FrC09.3

Data-Driven Safety Filter: An Input-Output Perspective, pp. 5106-5112.

Bajelani, Mohammad; van Heusden, Klaske

16:15-16:30 FrC09.4

Optimality of POD for Data-Driven LQR with Low-Rank Structures, pp. 5113-5118.

Newton, Rachel; Du, Zhe; Seiler, Peter; Balzano, Laura

16:30-16:45 FrC09.5

Data-Driven Controller Synthesis Via Finite Abstractions with Formal Guarantees, pp. 5119-5124.

Ajeleye, Daniel; Lavaei, Abolfazl; Zamani, Majid

FrC10 Dockside 2

Neural Networks (Regular Session)

Chair: Sivaranjani, S — Purdue University

Co-Chair: Saoud, Adnane — University Mohammed VI Polytechnic

15:30-15:45 FrC10.1

Lyapunov-Based Long Short-Term Memory (Lb-LSTM) Neural Network-Based Adaptive Observer, pp. 5125-5130.

Griffis, Emily; Patil, Omkar Sudhir; Hart, Rebecca; Dixon, Warren E.

15:45-16:00 FrC10.2

Lyapunov-Based Physics-Informed Long Short-Term Memory (LSTM) Neural Network-Based Adaptive Control, pp. 5131-5136.

Hart, Rebecca; Griffis, Emily; Patil, Omkar Sudhir; Dixon, Warren E.

16:00-16:15 FrC10.3

Recurrent Neural Network ODE Output for Classification Problems Follows the Replicator Dynamics, pp. 5137-5142.

Barreiro-Gomez, Julian; Poveda, Jorge I.

16:15-16:30 FrC10.4

Learning Dissipative Neural Dynamical Systems, pp. 5143-5148.

Xu, Yuezhu; Sivaranjani, S

16:30-16:45 FrC10.5

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Chair: Ong, Pio — California Institute of Technology

Co-Chair: Kim, Jung Hoon — Pohang Univeristy of Science and Technology

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Oruganti, Pradeep Sharma; Naghizadeh, Parinaz; Ahmed, Qadeer

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Chair: Aminzare, Zahra — University of Iowa

Co-Chair: Bianchin, Gianluca — University of Louvain

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Bianchin, Gianluca; Delvenne, Jean-Charles

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Nazerian, Amirhossein; Phillips, David; Frasca, Mattia; Sorrentino, Francesco

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Chair: Gordon, David Carl — University of Alberta

Co-Chair: Al Janaideh, Mohammad — University of Guelph

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Chair: Punta, Elisabetta — CNR-IEIIT

Co-Chair: Stolpe, Phoebus Raphael — Maastricht University

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Stein, Adrian; Singh, Tarunraj

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Chair: Koga, Shumon — Honda Research and Development

Co-Chair: Xu, Xiaodong — University of Texas at Austin

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Spinello, Davide; Konidala, Bhargav

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Chair: Ellis, Matthew — University of California, Davis

Co-Chair: Donkers, M.C.F. — Eindhoven University of Technology

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Chair: Shen, Minghao — University of Michigan

Co-Chair: Kwon, Joseph — Texas A&M University

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Chair: Rudie, Karen — Queen's Univ

Co-Chair: Medvedev, Alexander V. — Uppsala University

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Co-Chair: Ghoreishi, Seyede Fatemeh — Northeastern University

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Co-Chair: Zhao, Congran — Jiangsu University

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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

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CONFERENCE BANQUET

Thursday, July 11, 6:30 PM – 9:30 PM

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CLOSING RECEPTION

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