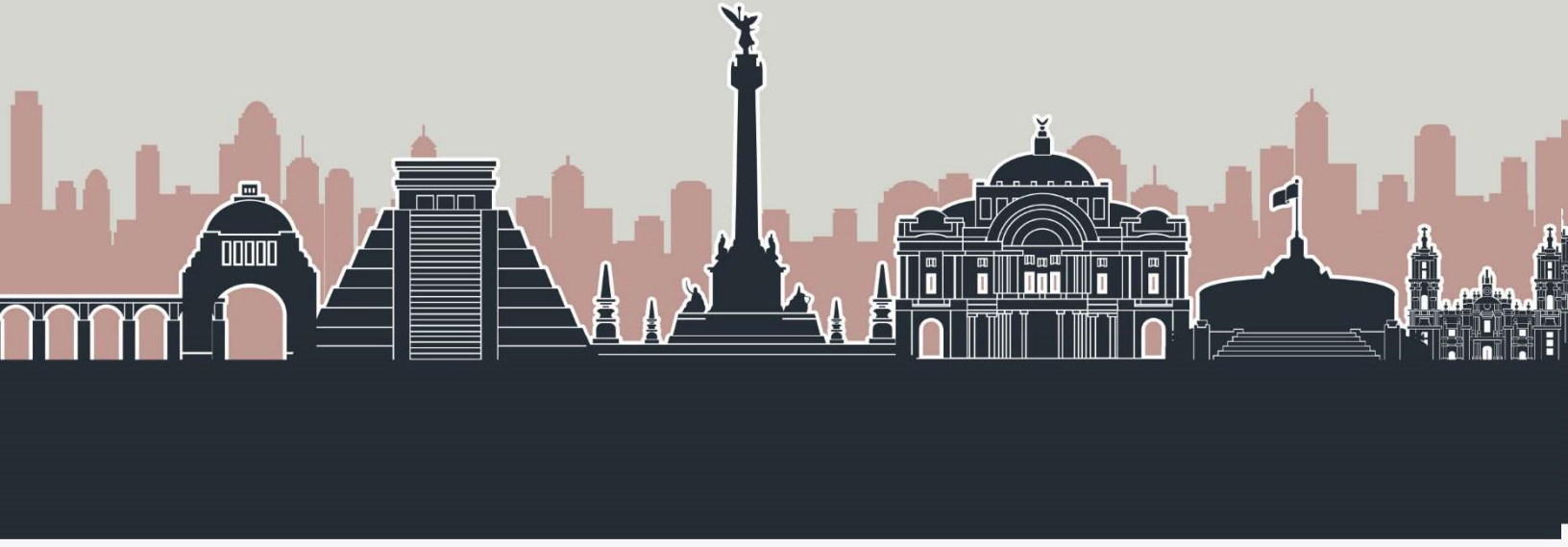
18th IEEE International Conference on Automation Science and Engineering

Mexico City, Mexico, August 20-24, 2022

CASE 2022

Final Program



IEEE Robotics & Automation Society

IEEE Advancing Technology for Humanity

Welcome to IEEE CASE2022

On behalf of the organizing committee, it is our pleasure to welcome all participants and friends to the IEEE 18th International Conference on Automation Science and Engineering (IEEE CASE2022), held in Mexico City on August 20-24, 2022 (with satellite site concurrently in Chengdu, China).

CASE is the flagship conference of the IEEE Robotics & Automation Society. It provides a primary international forum for automation researchers and practitioners to present and discuss their work. CASE2022 will include plenary and keynote sessions, contributed paper sessions, workshops and tutorial sessions, industry panel discussions, exhibitions from our corporate partners, and numerous social events and student activities. The theme of the conference is AI (Artificial Intelligence) Automation.

In the history of CASE conferences, this is the first time the conference will be held in Latin America, which is meaningful for local and international researchers, academics, and practitioners. It is also the first time the conference has a satellite site besides the main event and venue.

Mexico City is one of the largest cities in the world with rich cultural and historical attractions, and Chengdu is a charming ancient city and the hometown of the panda. CASE2022 will be a unique opportunity for attendees around the world to not only learn about the dynamics of automation science and engineering in Mexico and China, but also to experience these vibrant nations filled with passion, creativity, and diversity.

The Conference received submissions from more than 41 countries, including 6 workshop proposals, 29 special session proposals, 517 technical papers (among which 93 are joint RAL/CASE papers, 344 are full papers, 51 are presentation-only papers, and 29 are T-ASE presentation papers). In the final program, 385 technical papers (315 full papers and 70 presentation-only papers) were selected.

We appreciate the CASE community including the authors, the reviewers, and the editorial teams of CASE and RAL, as well as the T-ASE. Without their support we would not have been able to reach such a good number of submissions and high-quality evaluations. Finally, we would like to thank the steering committee, the organizing committee, and the volunteers for their hard work to make the hybrid, dual-site CASE2022 possible in the pandemic era.

We hope that CASE 2022 will be an exciting and memorable experience for all of you!

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Plenary Talks

Talk I: Robotic Manipulation: Sense, Touch, and Learn

Dr. Michael Y. Wang

Michael Yu Wang is a Professor and the Head of Department of Mechanical and Aerospace Engineering of Monash University. Before joining Monash University in 2022, he was the Founding Director of the Cheng Kar-Chun Robotics Institute. He also served on the engineering faculty at University of Maryland, Chinese University of Hong Kong, and National University of Singapore. He has numerous professional honors - Kayamori Best Paper Award of 2001 IEEE International Conference on Robotics and Automation, the Compliant Mechanisms Award-Theory of ASME 31st Mechanisms and Robotics Conference in 2007, Research Excellence Award (2008) of CUHK, and ASME Design Automation Award (2013). He was the past Editor-in-Chief of IEEE Trans. on Automation Science and Engineering, and served as an Associate Editor of IEEE Trans. on Robotics and Automation and ASME Journal of Manufacturing Science and Engineering. He is a Fellow of ASME, HKIE and IEEE. He received his Ph.D. degree from Carnegie Mellon University.

Abstract

This presentation focuses on our research work on developing tactile sensors and dry adhesion skins for robotic hands with dexterous and versatile capability for grasping and adaptive manipulation. It also presents an overview of exploratory solutions to modeling of hyper-elastic soft robots, distributed control of soft actuators (polymers or fluids), strategies for soft manipulation, and rapid prototyping and fabrication of the sensors and elastic robots. I will showcase the ability to adjust fingertip pose for better contact using sensor feedback, especially for top-side gripping onto a nearly flat surface (smooth or rough) of an object with firm attachment. I will show practical applications in industrial automation and discuss the recent developments throughout the robotics community advancing in this promising direction.

Talk II: Zero-Carbon Intelligent Energy Systems and Energy Revolution

Dr. Xiaohong Guan

Xiaohong Guan received his B.S. and M.S. degrees in Control Engineering from Tsinghua University, Beijing, China, in 1982 and 1985, respectively, and his Ph.D. degree in Electrical and Systems Engineering from the University of Connecticut in 1993. He was a senior consulting engineer with Pacific Gas and Electric from 1993 to 1995. He visited the Division of Engineering and Applied Science, Harvard University from 1999 to 2000. From 1985 to 1988 and since 1995 he has been with Xian Jiaotong University, Xian, China, and has been as the Cheung Kong Professor of Systems Engineering and Director of Systems Engineering Institute since 1999, was the director of the State Key Lab for Manufacturing Systems 1999-2009, Dean of School of Electronic and Information Engineering 2008-2018, and Dean of Faculty of Electronic and Information Engineering since 2019. From 2001 he has also been with the Center for Intelligent and Networked Systems, Tsinghua University, Beijing, China, and severed the Head of Department of Automation, Tsinghua University, 2003-2008.

Professor Guan is the member of Chinese Academy of Science and the Fellow of IEEE. His research interests include optimization of electrical power and energy systems, manufacturing systems, etc., and cyber-physical systems.

Abstract

This speech will discuss the new structure of green energy systems and how zero carbon emission energy system can be realized. In fact, economic energy storage technology is the key for fully utilizing new renewable energy sources. Production, storage and transportation, and utilization of hydrogen as a main energy source are introduced in the speech, and it is shown that hydrogen can become a major secondary energy source as important as electricity. The hydrogen based intelligent energy system will provide a new solution for energy supply and consumption with nearly zero-carbon emission and may lead to the energy revolution in the near future.

Talk III: Data analytics and optimization for smart industry

Dr. Lixin Tang

Professor Lixin Tang is the Vice President of Northeastern University, China, a member of Chinese Academy of Engineering, the Director of Key Laboratory of Data Analytics and Optimization for Smart Industry, Ministry of Education, China, the Director of Center for Artificial Intelligence and Data Science, and the Director and Chair Professor of the National Frontiers Science Center for Industrial Intelligence and Systems Optimization, Northeastern University. He is also a member of the discipline review group of the State Council for Control Science and Engineering, the Deputy Director of Artificial Intelligence Special Committee in Science and Technology Commission, Ministry of Education, China, the Vice President of Operations Research Society of China (ORSC), and the Founding Director of Data Analytics and Optimization Society for Smart Industry of ORSC.

His research interests cover industrial intelligence and systems optimization theories and methods, covering industrial big data, data analytics and machine learning, deep learning and evolutionary learning, reinforcement learning and dynamic optimization, convex and sparse optimization, integer and combinatorial optimization, and computational intelligence-based optimization. For technologies, he mainly investigates on systems optimization technology for plant-wide production and inventory planning, production and logistics batching and scheduling, process optimization and optimal control; quality analytics technology such as process monitoring, equipment diagnosis, and product quality perception; industrial intelligence technology such as image and speech understanding and visualization. Meanwhile, he applies the above theories and technologies to engineering applications in manufacturing, logistics and energy systems.

He has published more than 137 papers in international journals such as IEEE Transactions on Evolutionary Computation, IEEE Transactions on Cybernetics, IEEE Transactions on Control Systems Technology, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Power Systems, Operations Research, Manufacturing & Service Operations Management, INFORMS Journal on Computing, IISE Transactions and Naval Research Logistics. His paper published on IISE Transactions received the Best Applications Paper Award of 2017.

He currently serves as an Associate Editor of IISE Transactions, IEEE Transactions on Evolutionary Computation, IEEE Transactions on Cybernetics, Journal of Scheduling, International Journal of Production Research, and Journal of the Operational Research Society. Meanwhile, he is on the Editorial Board of Annals of Operations Research and serves as an Area Editor of the Asia-Pacific Journal of Operational Research.

Abstract

Data analytics is the frontier basic research direction of industrial intelligence and one of the driving forces to promote scientific development. Systems optimization is the core basic theory of decision-making in smart industry, as well as the heart and engine of data analytics. This talk will discuss some systems modeling methods and optimization solution methods we have been working on. The systems modeling methods are to quantitatively describe different practical problems with proper formulations,

including set-packing model, space-time network model, and continuous-time based model. The optimization solution methods include integer optimization, convex optimization, intelligent optimization, and dynamic optimization. This talk will also introduce systems optimization and data analytics of production, logistics, and energy in the steel industry, including: 1) production batching and scheduling in steelmaking/continuous casting, and hot/cold rolling operations; 2) logistics scheduling in loading operations, shuffling/reshuffling, and stowage; 3) data analytics-based energy optimization, including dynamic energy allocation and scheduling, energy analytics covering energy description, diagnosis and prediction; 4) data analytics, including temperature prediction of blast furnace, dynamic analytics of BOF steelmaking process based on multi-stage modeling, temperature prediction of reheat furnace based on mechanism and machine learning, and strip quality analytics of continuous annealing based on multi-objective ensemble learning.

Talk IV: Evolvable field-level automation architectures to leverage AI for physical manufacturing and logistics systems

Dr. Birgit Vogel-Heuser

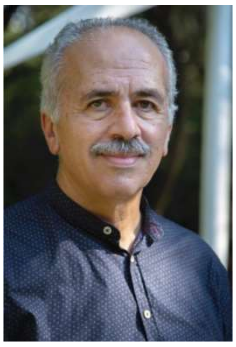
Birgit Vogel-Heuser received her Dipl. Ing. degree in electrical engineering in 1987 and her Dr.-Ing. degree in mechanical engineering in 1990 from the RWTH Aachen, Germany. She acquired over ten years industrial experience in industrial automation. After different professorship positions, she was appointed to the Chair of Automation and Information Systems at the Technical University Munich in 2009. Her research is focusing on evolvable field-level automation and appropriate architectures for manufacturing and logistic systems. She is a Senior Member of the IEEE; IEEE RAS Distinguished Lecturer, Co-Chair of IEEE RAS TC Digital Manufacturing and Human-Centered Automation and a member of the National Academy of Science and Engineering in Germany (acatech).

Abstract

Manufacturing and logistic systems operate for decades and need to evolve to manufacture new products, increase quality, energy, or overall efficiency. Consequently, automation hardware and software adaptation in the operation phase is crucial. Means to design such automation architectures compliant to Industry 4.0 are of high economic interest. The talk will introduce means to analyze existing automation architectures as a first step to refactoring. In the second step, the integration of AI into such architectures will be discussed. Finally, automation architectures that ease the adaptation of physical manufacturing and logistics systems will be presented.

Talk V: Incorporating causal knowledge in robot learning

Dr. Luis Enrique Sucar



Dr. L. Enrique Sucar is Senior Research Scientist at the National Institute for Astrophysics, Optics and Electronics, Puebla, Mexico. He received a master's degree in computer systems from the Stanford University and a PhD in Computing from Imperial College. He has been an invited professor at Imperial College, UK; the University of British Columbia, Canada; INRIA, France and CREATE-NET, Italy. Dr. Sucar received the National Science Prize from the Mexican President in 2016. He is Member of the National Research System, the Mexican Science Academy, a Senior Member of the IEEE, and Ex-President of the Mexican Academy of Computing. He has more than 400 publications in journals and conference proceedings. He has served as president of the Mexican AI Society, has been member of the Advisory Board of IJCAI, and is associate editor of the journals Pattern Recognition and Computational Intelligence. He is interested in understanding and building intelligent systems that can interact with the real world, taking the best decisions under uncertainty, based on probabilistic and causal graphical models.

Abstract

Reinforcement learning has been applied to solve several complex problems in robotics and automation; however, learning optimal policies in continuous state and action spaces takes a very long time. Incorporating causal knowledge helps to focus exploration and avoid unnecessary actions, thus significantly reducing the number of episodes to obtain an optimal solution. Additionally, the causal models can be easily transferred to similar tasks. In this talk I introduce causal graphical models, including causal reasoning and discovery. I will then explain how to incorporate a causal model into a traditional reinforcement algorithm, and apply it to solve different problems, including robotic manipulation. Finally, I will present our recent work on learning and using a causal model simultaneously.

Panel Discussions

Special Panel: *Machine Learning for Automation*

Machine learning (ML) is changing the world, and in particular, the world of automation. So far, this wave of ML research has also influenced the main themes at IEEE CASE 2018-2021: Knowledge-based Automation, Smart Automation, Automation Analytics, and Data-Driven Automation. The critical question, however, is: How much of groundbreaking ML research has been performed in our community in recent years? Are we leading actors, or more followers, applying what others have already formulated? An AdHoc on Machine Learning for Automation has recently been initiated by the CASE steering committee. The goal is that CASE, T-ASE, and relevant TCs shall become important players in the tough scientific race around ML that is going on right now. This panel discussion will take that goal as a starting point, and then reason about how we can build strong automation related ML research, by identifying organizational and infrastructural support, but also niche areas where our research community should take the lead. The goal is simply to achieve results that counts, both concerning fundamental methodology development and applications in strategic areas, which cause not small but big improvements within the limited resources we still have on our common planet.

Moderator

Bengt Lennartson, Professor, Division of Systems and Control, Department of Electrical Engineering, Chalmers University of Technology, Gothenburg, Sweden.
Bengt Lennartson is a Professor of the Chair of Automation since 1999 at Chalmers University of Technology, Gothenburg, Sweden. He has been Associate Editor for Automatica and IEEE Transaction on Automation Science and Engineering, General Chair of IEEE CASE 2015, WODES 2008 and Dean of Education at Chalmers. He is the (co)author of 300+ peer reviewed international papers, and his research is currently focused on AI planning and learning, as well as sustainable production. He is IEEE Fellow.

Panelists

Maria Pia Fanti, Professor, Department of Electric and Information Engineering, Polytechnic University of Bari, Italy.
Maria Pia Fanti has been with the Department of Electrical and Information Engineering of the Polytechnic of Bari, Italy, since 1983 and she is currently a full professor of system and control engineering. Her research interests include management and modeling of complex systems, such as transportation, logistics and manufacturing systems. Prof. Fanti has published more than 315 papers and two textbooks on her research topics. She was senior editor of the IEEE TASE and she is AE of the IEEE Trans. on SMC: Systems. She was member at large of the Board of Governors of the IEEE SMCS, and currently she is member of the AdCom of the IEEE RAS, and chair of the RAS. Prof. Fanti was General Chair of the 2011 IEEE CASE and the 2019 IEEE SMC.

Weihong "Grace" Guo, Associate Professor, Department of Industrial and Systems Engineering, Rutgers, The State University of New Jersey.
Weihong "Grace" Guo is an Associate Professor in the Department of Industrial and Systems Engineering at Rutgers University-New Brunswick, USA. She earned her B.S. degree in Industrial

Engineering from Tsinghua University, China, in 2010 and her Ph.D. in Industrial & Operations Engineering from the University of Michigan, Ann Arbor, in 2015. Her research focuses on manufacturing data analytics, process monitoring, anomaly detection, quality evaluation, and system informatics. She is a member of IEEE, IISE, INFORMS, ASME, and Tau Beta Pi.

Qing-Shan Jia, Professor, Center for Intelligent and Networked Systems, Tsinghua University, Beijing, China.
Qing-Shan Jia is a full professor at Center for Intelligent and Networked Systems, Department of Automation, Tsinghua University, Beijing, China. His research interest is to develop an integrated datadriven, statistical, and computational approach to find designs and decision-making policies which have simple structures and guaranteed good performance. His work relies on strong collaborations with experts in manufacturing systems, energy systems, autonomous systems, and smart cities. He was an AE of IEEE T-ASE and T-AC, and is a member of the IEEE CASE Steering Committee.

Feng Ju, Associate Professor, School of Computing and Augmented Intelligence, Arizona State University, Phoenix, USA.
Dr. Feng Ju is an Associate Professor with the School of Computing and Augmented Intelligence, Arizona State University. His research interests include machine learning and optimization of smart manufacturing systems and additive manufacturing. He was a recipient of multiple awards, including Dr. Hamed K. Eldin Outstanding Early Career IE in Academia Award, the Best Paper Awards in IISE Transactions and IFAC MIM, and the Best Student Paper Award in IEEE CASE.

Peter B. Luh, Professor, Department of Electrical Engineering, National Taiwan University Electrical and Computer Engineering, University of Connecticut, Storrs, Connecticut, USA.
Peter Luh was with U. Connecticut 1980-2020, and was a Board of Trustees Distinguished Professor and the SNET Professor of Communications & Information Technologies upon retirement. He is now a Distinguished Chair Professor at National Taiwan University. He was the founding EiC of T-ASE, a CoFounder of CASE, and is a member of the IEEE Publication Services and Products Board, and the Chair of its Publishing Conduct Committee. His research includes intelligent manufacturing, smart grid, and energysmart buildings, with optimization cutting across them. He received RAS 2013 Pioneer Award, 2017 George Saridis Leadership Award, and T-ASE 2019 Best Paper Award.

Frank C. Park, Professor of Mechanical Engineering, Seoul National University, Seoul, South Korea.
Frank C. Park is Professor of Mechanical Engineering and also Vice-Dean of the Graduate School of Data Science at Seoul National University. He received the B.S. in EECS from MIT in 1985, the Ph.D. in applied mathematics from Harvard in 1991, and was on the faculty of the University of California, Irvine from 1991 to 1994 before joining SNU in 1995. He is a fellow of the IEEE, and has held adjunct faculty positions with the HKUST Robotics Institute in Hong Kong, the Interactive Computing Department at Georgia Tech, and the NYU Courant Institute. His research interests include robotics, computer vision, mathematical data science, and related areas of applied mathematics. He is a former Editor-in-Chief for the IEEE Transactions on Robotics, developer of the EDX course Robot Mechanics and Control I-II, and author (with Kevin Lynch) of the textbook Modern Robotics: Mechanics, Planning, and Control (Cambridge University Press, 2017). He is president of the IEEE Robotics and Automation Society (2022–2023), and founder and CEO of the industrial AI startup Saige Research (http://saige.ai).

Karinne Ramirez-Amaro, Associate Professor, Division of Systems and Control, Department of Electrical Engineering, Chalmers University of Technology, Gothenburg, Sweden.
Dr. Karinne Ramirez-Amaro is an Associate professor at Chalmers University of Technology since March 2022. Previously, she was a post-doctoral researcher at the Technical University of Munich (TUM), Germany. She completed her Ph.D. (summa cum laude) at the Department of Electrical and Computer Engineering at TUM in 2015. She has received different awards, e.g. the price of excellent Doctoral degree for female engineering students and the Google Anita Borg scholarship. In 2022, Karinne was elected as member of the Administrative Committee (AdCom) from the IEEE Robotics and Automation Society (RAS) and she is the chair of the IEEE RAS Women in Engineering (WiE). Her research interests include Explainable AI, Semantic Representations, Cause-based Learning Methods, Collaborative Robotics, and Human Activity Recognition and Understanding.

MengChu Zhou, Professor, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, USA.
MengChu Zhou is Distinguished Professor at New Jersey Institute of Technology. His interests are in automation, Internet of Things, and AI. He has 1000+ publications including over 600 IEEE transactions papers, 12 books, and 30 patents and 29 book-chapters. He is Fellow of IEEE, IFAC, AAAS, CAA and NAI.

Industry Panel I: Artificial Intelligence in Mexican Industry

Artificial Intelligence (AI) uses computer algorithms to simulate human intelligence, mainly focused on learning and decision-making processes. Due to the maturity of the area and the new advances in AI branches such as machine and deep learning, the industrial applications of AI have been increasing rapidly. Today AI is present in the algorithms to drive cars, land planes, render images, make decisions, among many other applications. This growth makes us wonder, what is the future of AI in autonomous vehicles (cars, planes)? How will AI solve problems in artificial vision or in autonomous surgical systems? Regulations and ethical questions must be addressed when using AI to solve critical problems. This panel looks at how Continental, Intel and Wizeline view the use of AI to solve industrial problems.

Moderator

Andres Mendez Vázquez, Professor/Researcher, CINVESTAV-IPN

Panelists

Dr. Andres Mendez Vázquez

Dr. Mendez is currently with Cinvestav Guadalajara, his research interest fields are the artificial intelligence, mainly the areas of machine and deep learning. He has participated in many projects of Machine Learning, Artificial Intelligence and Deep Learning for several startup, USA Army, Mexican Air Force, Oracle MDC, IBM Mexico, etc.

Dr. Alberto de Obeso

Dr. de Obeso is with Wizeline as the Director of Artificial Intelligence. His ultimate goal as a professional is to deliver solutions with clear advantages over classic approaches by combining sound software design principles with powerful techniques derived from the Artificial Intelligence realm. He has 18+ years of experience developing software and data-driven solutions in different languages and platforms for complex organizations. 7+ years of performing increasingly demanding leadership roles, his intent is to keep growing on this path. During his doctoral studies in the UK, he explored complex problem-solving behavior from a computational perspective. He is a postgraduate teacher at ITESO and TEC de Monterrey. and has two patent applications.

Dr. Julio Zamora

Dr. Zamora is Principal Engineer and Senior Research Scientist Manager at Intel Labs, Leading globally the Human Robot Collaboration Group as a part of Intelligent System Research Group. He received a master's degree in computer sciences and PhD in Electric Engineering from CINVESTAV. Dr. Zamora had a post-Doctoral position at KAIST, Korea. He was nominated for the W.K. Clifford international price for his contributions to geometric algebra, introducing the Quadric Geometric Algebra and the formulation of Robot dynamics in terms of octonions. He is member of the National Research System, the Mexican Association for Computer Vision, Neural Computing and Robotics, and Senior member of IEEE. He has more than 60 patents in process and more than 30 publications in journals, book chapters and conference proceedings. His research interests include Artificial Intelligence, Computer Vision, Geometric Algebras, Robotics, and Image Processing.

MBA Edú Brasil López San Vicente

He is currently the Director of Research and Development of Continental Automotive Guadalajara. He is responsible for the innovation and business strategy of "Vehicle Networking and Information" in Mexico, as well as the administration and direction of the engineering community of all its business units and core areas of the sector "Automotive Technologies" of Continental Automotive in Mexico. He has more than 20 years of experience in development and innovation of electronic products for the automotive and telecommunications industries, working in Mexico, Japan, USA and Germany. He has led worldwide teams for the innovation, research and development of mechanical products, and he has designed strategies to establish engineering centers in Mexico and led the transfer of responsibilities from Japan and the United States to Mexico.

Industry Panel II: Trends in Industrial Automation

This session explores the latest trends in adoption of robotics, artificial intelligence, machine vision and related automation. Real world examples of leading applications in major industries such as manufacturing, warehousing & distribution, and more will be discussed, as well as the impacts of increased automation on jobs.

Moderator

Jeff Burnstein, President of the Association for Advancing Automation (A3)

Jeff Burnstein is the President of A3, the leading North American trade group representing over 1100 global companies involved in robotics, artificial intelligence, vision, motion control and related automation technologies. Burnstein joined the association in 1983 and has held a variety of senior positions, culminating in his promotion to President in 2007. He is a frequent commentator in the media, often discusses automation issues with policy makers, and regularly speaks at global conferences on issues such as the impact of automation on jobs and the future of automation beyond the factory floor. Burnstein also serves on the Executive Board of the International Federation of Robotics (IFR).

Panelists

Manuel Sordo, APERA AI, Chief Commercial Officer

Manuel brings more than 25 years of sales and business management experience to Apera AI. He has considerable commercial expertise in the automation and robotics markets. Most recently, Manuel was Universal Robots' Regional President for Latin America. Manuel holds an MBA from California Intercontinental University.

Denis Pineda Universal Robots-Latam, Regional President, Latin America

Denis started his technology career in Universal Robots in 2016 when the transition from traditional robotics to collaborative robots market happened. After developing South America market for 5 years, he recently was invited to lead Universal Robots Latin America as Reginal President. Denis is an industrial engineer, he obtained Executive MBA at BSP (Business School São Paulo) in 2016, and diplomas on Design Thinking and Creativity for Business at INSEAD in 2020. He has 20 years career mainly on the automotive industry, in areas of sales, engineering, purchasing, etc., and consistent international experience on global projects.

Luis Quintanilla, Omron, Business Developer Specialist Robotics

Luis Quintanilla, currently working at OMRON as Robotics Business Developer for Mexico, has more than 12 years of experience in automation complemented by knowledge of vision, safety, sensors, and control. He has bachelor's degree in Mechatronics Engineering and Master in Sales Management. This experience complements the development of all types of Robotics projects with a commercial and technical profile. He has successfully participated in the implementation of engineering projects in different industries such as Automotive, Digital, and Medical.

Workshops

Workshop I: Machine Learning for Automation

The enormous interest in artificial intelligence and especially machine learning (ML) among scientists in different research fields has recently also influenced the focus of our CASE conference. This is manifested by the main themes at IEEE CASE 2018-2021: Knowledge-based Automation, Smart Automation, Automation Analytics, and Data-Driven Automation. Since learning is such an important tool in many automation solutions, including data-based model generation, online optimization, and adaptive control, it is crucial to increase our activities in this field even further, to become an important player in the tough scientific race around ML that is going on right now.
The goal of this workshop is therefore to create a deeper interest and understanding of ML, but also to identify niche areas of ML in automation, where our research community should take the lead. More specifically, we want to present some interesting ongoing research activities, but also to discuss and propose what we believe are important research directions where automation can play an important role in this dynamic research area.
The presentations in this workshop will be given by members of a recently created AdHoc on Machine Learning for Automation. This AdHoc is focused on how to strengthen research activities, but also organization and infrastructure around ML research within automation. The workshop will therefore conclude with an open discussion to get interesting inputs for future activities within this challenging research field.

Organizers：
Bengt Lennartson, Chalmers University of Technology
Qing-Shan Jia, Tsinghua University
Maria Pia Fanti, Polytechnic University of Bari
Peter B. Luh, University of Connecticut
Jingang Yi, The State University of New Jersey
Karinne Ramirez-Amaro, Chalmers University of Technology

Workshop II: Machine Learning for Additive Manufacturing

Quality and productivity are critical for additive manufacturing (AM). With increased availability of AM product data, Machine Learning for AM (ML4AM) has become a viable strategy for knowledge discovery and performance enhancement. This workshop provides tutorial on engineering-informed data analytics framework to facilitate efficient machine learning of AM product data, process monitoring and defect detection for the new wire arc additive manufacturing (WAAM), and deep learning-based monitoring of weld penetration for WAAM application.

Organizers：
Qiang Huang, University of Southern California
Zengxi Pan, University of Wollongong
Yuming Zhang, University of Kentucky

Workshop III: AI for Efficiency and Sustainability in Industrial Disassembly Processes

Efficiency and sustainability will be the key for the future factory, whose main focus will be on efficient and sustainable industrial processes. A sustainable production, an efficient use of the resources, and an increase in the recovered and reused products will be crucial to reduce the impact of the production on the environment, in compliance with the upcoming Industry 5.0 paradigm. Artificial intelligence (AI) and robotics are leading to deep workplace innovation, optimizing human-machine interactions, and giving more importance to workers. But the environmental goals can only be achieved by rethinking the production processes in order to limit the environmental impact. Disassembly is an industrial process that will have to be continuously optimized to increase efficiency and sustainability in years to come. Disassembly extracts valuable components/materials from end-of-life goods for reuse and recycling. It is also used in product refurbishment when products are restored to full manufacturer conditions by running quality tests and replacing broken or defective parts. Refurbishing products is a great opportunity for sustainability as it gives new life to used products instead of producing new ones, thereby providing consumers with quality products at an affordable price. Statistics say that the refurbished market for consumer electronics is estimated to be $10 billion. Disassembly consists of a series of tasks performed in lines made up of workstations where workers may be assisted by robots. Making these lines as efficient and sustainable as possible includes the design, the optimization, and the improvement of the collaborations between workers and machines. Artificial Intelligence (AI) can help deal with the complexity of these problems to find and implement solutions that increase efficiency and reduce the impact of production on the environment. This Workshop aims to collect the latest research and achievements and discuss the progress regarding advanced AI techniques for optimal industrial disassembly processes.

Organizers：
Xiwang Guo, Liaoning Petrochemical University
Jiacun Wang, Monmouth University

Workshop IV: Benchmarking Coaxial Rotor Systems to Optimize Performance in Autonomous Applications

In the UAV field, the efforts to develop drones with more payload and flight time capacity are constant. Coaxial multirotor drones offer high payload capacity in a relatively small vehicle footprint [1]. However, compared to regular ’flat’ multirotors, they exhibit a much lower efficiency. The content covered in this proposed tutorial is based on a very recent work of the authors where they developed a control allocation method in which experimental results showed an increase in efficiency of up to 11% compared to the current state-of-the-art [2]. Additionally, the tutorial also covers the operation of an open-source benchmarking platform developed by the authors with the purpose of testing and optimizing the performance of coaxial rotor systems. Therefore, the tutorial will provide the participants with all the tools needed to perform experiments, develop, and implement control allocation methods to improve the efficiency of coaxial rotor systems in autonomous applications.

Organizers:
Minas Liarokapis, The University of Auckland
Joao Buzzatto, The University of Auckland

Workshop V: Semiconductor Smart Manufacturing Technology

AI-based Smart Manufacturing Systems (AISMS) incorporates various technologies, i.e., Internet of Things (IoT), big data analytics, system modeling, and Artificial Intelligence (AI). Such technologies are permeating different aspects of manufacturing industry and make it smart and capable of addressing challenges such as interoperability, decentralization, distributed control, real-time manufacturing process control, service orientation, and maintenance optimization. As one of the most sophisticated manufacturing industries, semiconductor industry has been actively adopting AISMS to boost productivities.

This is a half-day workshop on semiconductor smart manufacturing technology workshop. The purpose of this workshop is to share with IEEE communities the recent advancement and development of semiconductor smart manufacturing technologies and relevant applications ranging from semiconductor tools scheduling, AI based defect detection and classification, smart equipment dispatch, intelligent process control, etc. The workshop aims to provide technical discussion forum for researchers from different fields and promote interdisciplinary and multidisciplinary research collaboration.

Organizers:
Yan Qiao, Macau University of Science and Technology
Bin Liu, IKAS Industries (Guangdong) Company, Ltd.

Workshop VI: Robot Teams: Challenges, Models, and Methodologies

Multi-robot teams have been used in a wide range of applications, including surveillance, inspection, rescue, automation, and logistics. Due to the variety of critical components in these applications, the collaboration between agents in the robot team can quickly become a challenging problem, particularly when there is a variety of hardware, battery life, size, and functionalities of the robots that are moving in a dynamic environment. Because the robots are working in a dynamic environment, they need to dynamically change their behaviors to adapt to the state of the environment in a way that is fully coupled to the type of agent. For example, depending on the robot, some environmental constraints can be waived or become more restricted. The tasks need to be assigned and managed precisely to achieve the goals while minimizing the execution time and energy costs and avoiding collisions.

Role-Based Collaboration (RBC) is a flexible strategy that can facilitate agent collaboration between agents in centralized or decentralized management by using the Environments – Classes, Agents, Roles, Groups, and Objects (E-CARGO) model. Research shows that the RBC methodology can be used to manage a robot team's performance by optimizing task allocations. However, a critical part of RBC is the role assignment which requires a pertinent evaluation matrix, i.e., Q, that reflects the qualification of each agent for each role.

Organizers:
Haibin Zhu, Nipissing University
Junqi Zhang, Tongji University
Behzad Akbari, Nipissing University
Peng Zu, Tongji University
YuXuan Lin, Tongji University

Main Conference Venue

Sheraton Maria Isabel Hotel, Mexico City

Address: Av. Paseo de la Reforma 325, Cuauhtémoc, 06500 Mexico City, Mexico

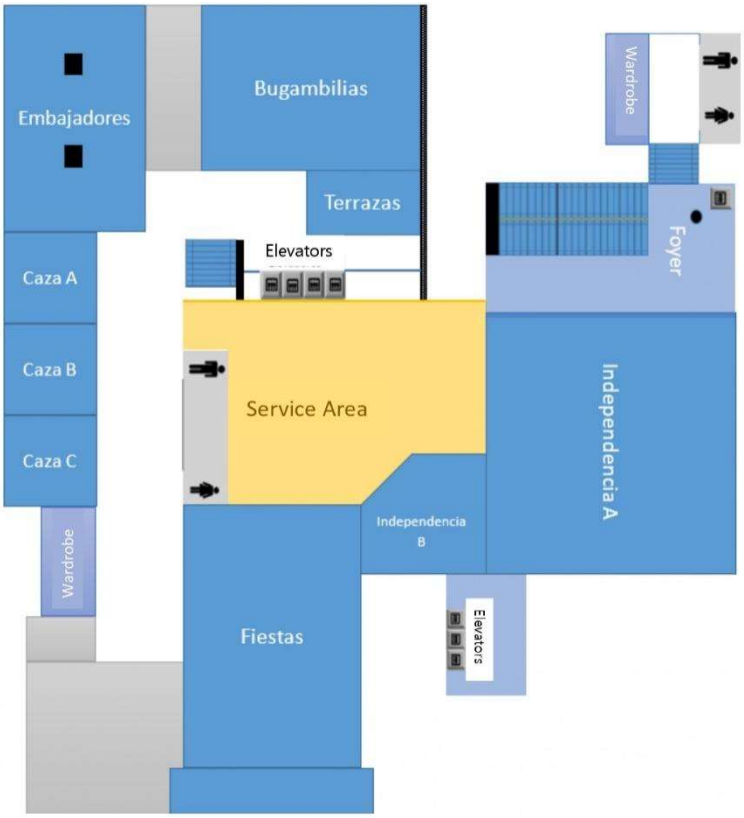
The luxury 5-star Sheraton Maria Isabel Hotel locates in the heart of Mexico City surrounded by the Zona Rosa district, you will be steps from extravagant shopping centers, restaurants, nightlife, monuments of Angel, the city park Bosque de Chapultepec, museums, and historic grounds such as the National Palace, Palacio de Bellas Artes, and Metropolitan Cathedral.

Within the Sheraton Maria Isabel Hotel, enjoy gourmet meals at a selection of restaurants or sip cocktails in the lobby bar. When you need some relaxation, enjoy our heated outdoor pool and fitness center with a sauna, or slip off to your stylish suite featuring thoughtful amenities with gorgeous views of the city and the Sheraton Signature Sleep Experience beds.

Travel information: http://cdmxtravel.com/en/

2nd floor

SHERATON
Mexico City
Maria Isabel Hotel



SHERATON
Mexico City
Maria Isabel Hotel

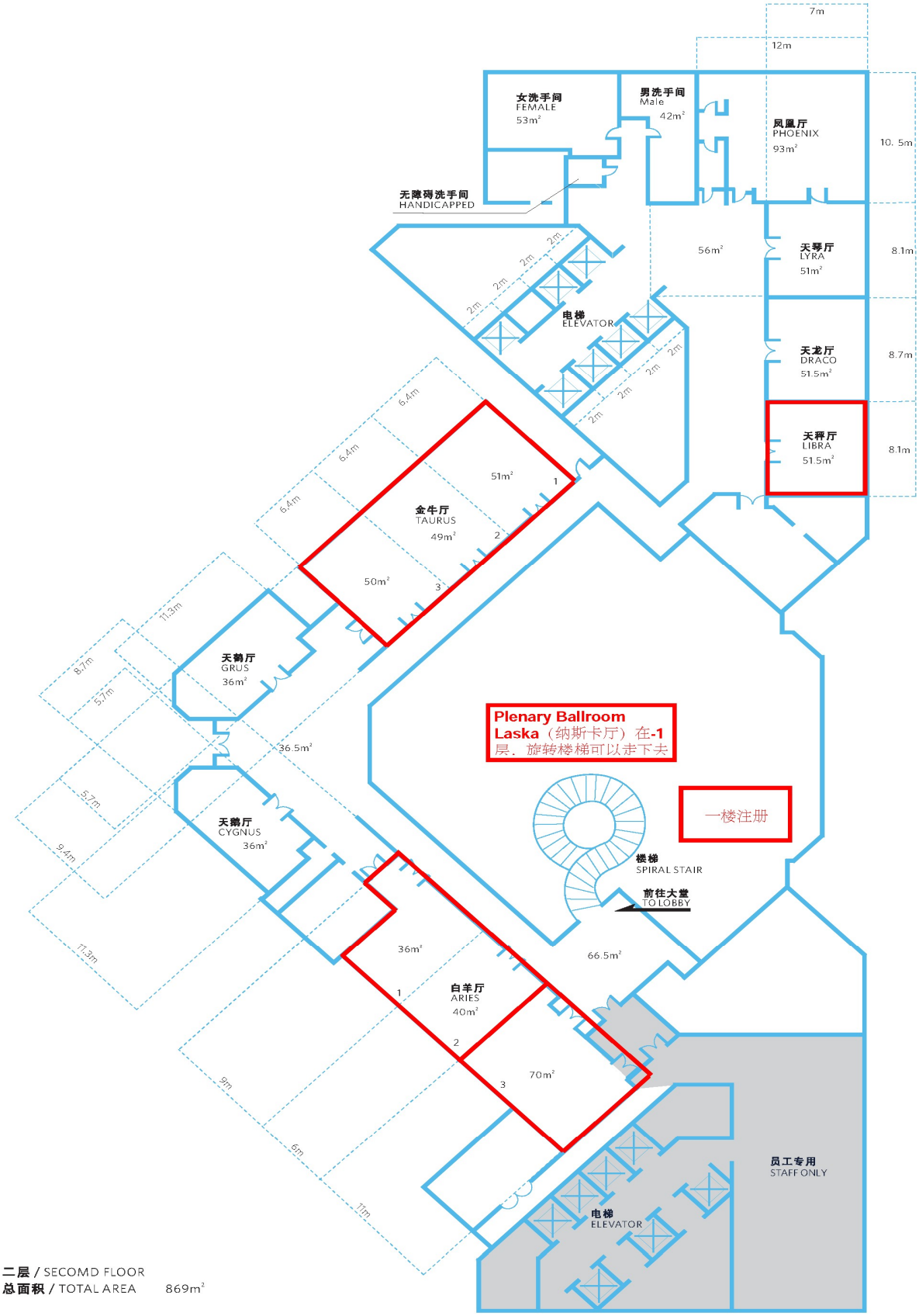
3rd floor

Satellite Conference Venue

Hilton Chengdu Hotel, Chengdu, P.R. China

Address: No. 666 Tianfu Av., Chengdu, 610093, China

Hilton Chengdu hotel is in Chengdu's business district, the Tianfu New District, in a short walk distance from Tianfu Software Park, the metro, and Century City International Convention & Exhibition Center. New Century Global Mall is six kilometers away and 40 minutes from the Chengdu Panda Breeding Research Center. The amenities include spa, fitness center, and pool. You can enjoy all-day dining and drinks at hotel restaurants.



二层 / SECOMD FLOOR
总面积 / TOTAL AREA 869m²

Health & Safety

The health and safety of our conference attendees is our top priority. CASE2022 will be following all local guidelines and adhering to venue-specific standards to host the event safely and effectively.

Increased Sanitization and Hygiene

- Hand sanitizing products will be made available throughout the conference hotel
- Sanitizing wipes will be provided in every room for speaker use at the podium
- Audio-visual equipment such as keyboards, laser pointer, and mics will be wiped down with sanitizer wipes between each session and at regular intervals throughout the day

What You Can Do to Help Onsite

- **Masks are mandated in all indoor public areas in Mexico City**. Wearing a mask in indoor public space can help protect you and everyone else close to you.
- Wash your hands frequently with soap and water for 20 seconds or use an alcohol-based hand sanitizer.
- Follow the World Health Organization's (WHO) and the Mexico Secretary of Public Health guidelines to prevent the spread of infectious diseases at the event
- Discourage physical greetings like handshakes, high fives, fist or elbow bumps, and hugs
- Wash your hands frequently with soap and water for 20 seconds or use an alcohol-based hand sanitizer
- Maintain social distancing between yourself and anyone who is coughing or sneezing
- If you have fever, cough, and difficulty breathing, seek medical care immediately.

Local Antigen or PCR Testing

Many phamacies and laboratories can do COVID test, ask the address of the branch near to where you are.

- Farmacia San Pablo
- Farmacia Ahorro
- Laboratorio Eugenio Sue
- Laboratorio Medico Polanco
- Laboratorio Chopo
- Etc.

If you participate CASE2022 on the satelite site (Chengdu), please prepare according to the latest local COVID-19 prevention requirements.

Thank you for your cooperation!

Program Overview

Program Overview MEXICO CITY				
Saturday, August 20th	Sunday, August 21st	Monday, August 22nd	Tuesday, August 23rd	Wednesday, August 24th
9:00-12:15 Workshops	8:00-8:10 Opening Remarks 8:10-9:00 Plenary I 9:00-9:10 Break 9:10-10:00 Special Panel 10:00-10:15 Coffee Break 10:15-12:15 Best Conference & Best Application Papers	8:10-9:00 Plenary II 9:00-9:10 Break 9:10-10:00 Industry Panel I / Best Healthcare Automation Papers 10:00-10:15 Coffee Break 10:15-12:15 Industry Panel II /Best Student Papers	8:10-9:00 Plenary III 9:00-9:10 Break 9:10-10:00 Awards Ceremony 10:00-10:15 Coffee Break 10:15-12:15 7 Technical Sessions	9:00-12:15 Technical tours (depends on COVID-19 policy)
Lunch	Lunch With Leaders	Women in Engineering Luncheon	Job Opportunities in Industry Luncheon	
13:45-17:45 Workshops	13:45-15:45 7 Technical Sessions 15:45-16:00 Coffee Break 16:00-17:45 7 Technical Sessions	13:45-15:45 7 Technical Sessions 15:45-16:00 Coffee Break 16:00-17:45 7 Technical Sessions	13:45-15:45 7 Technical Sessions 15:45-16:00 Coffee Break 16:00-17:45 7 Technical Sessions	
19:00-21:00 Welcome Reception		19:00-21:00 Conference Banquet	19:00-21:00 Farewell Reception	

Program Overview CHENGDU

Saturday, August 20th	Sunday, August 21st	Monday, August 22nd	Tuesday, August 23rd	Wednesday, August 24th
	8:00-10:00 3 Technical Sessions 10:00-10:15 Coffee Break 10:15-12:15 3 Technical Sessions	8:00-10:00 Plenary I & II 10:00-10:15 Coffee Break 10:15-12:15 3 Technical Sessions	8:00-10:00 3 Technical Sessions 10:00-10:15 Coffee Break 10:15-12:15 2 Technical Sessions	8:00-12:15 Technical tours
	Lunch	Lunch	Lunch	
14:00-17:00 Registration 18:30-20:30 Welcome Reception	14:00-17:00 Workshops	14:00-17:00 Student Activities 18:30-20:30 Conference Banquet	14:00-17:00 Student Activities 18:30-20:30 Farewell Reception	14:00-17:00 Technical Tours

Program at a Glance

Sessions in green background are on Mexico City Site
Sessions in blue background are on Chengdu site

CASE 2022 Program at a Glance Saturday August 20, 2022

Track M1	Track M2	Track M3	Track M4	Track C1	Track C2	Track C3
05:30-07:30 SaWRBr MIX (first floor) Welcome Reception (Chengdu)						
09:00-12:30 SaWAM1 Imperio A Workshop 1 (AM)		09:00-12:30 SaWAM3 Constitucion B Workshop 3	09:00-12:30 SaWAM4 Constitucion C Workshop 4			
12:30-14:00 SaLuMBr Lunch Break 1						
14:00-17:00 SaWBM1 Imperio A Workshop 1 (PM)	14:00-17:00 SaWBM2 Constitucion C Workshop 2					
19:00-21:00 SaWMBr Salon Angel Welcome Reception				19:00-21:00 SaAC1 Aries 1 & 2 Automation for Data Analytics (Chengdu)	19:00-21:00 SaAC2 Aries 3 Automation for Manufacturing and Logistics 1 (Chengdu)	19:00-21:00 SaAC3 Taurus Foundations of Automation 1 (Chengdu)
21:00-21:15 SaCo_Br Room T1 Coffee Break 1 (Chengdu)						
				21:15-23:15 SaBC1 Aries 1& 2 Human-Robot Collaboration for Futuristic Human-Centric Smart Manufacturing (Chengdu)	21:15-23:15 SaBC2 Aries 3 Data Analytics and Optimization for Manufacture-Circulation Industrial System (Chengdu)	21:15-23:15 SaBC3 Taurus Machine Learning and AIs for Quality & Reliability Assessment and Enhancement (Chengdu)
23:15-24:00 SaLuCBr MIX (first floor) Lunch Break 1 (Chengdu)						

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CASE2022 Program at a Glance Sunday August 21, 2022

Track M1	Track M2	Track M3	Track M4	Track M5	Track M6	Track M7	Track C1	Track C2	Track C3
00:00-01:00 SuLuC1_Br Room T8									
								01:00-04:00 SuWCC2 Aries 1 & 2 Workshop 5 (Chengdu)	01:00-04:00 SuWCC3 Aries 3 Workshop 6 (Chengdu)
07:45-08:00 SuOBr Salon Fiestas Opening Session									
08:00-09:00 SuP1L Salon Fiestas Plenary I									
09:00-09:10 SuS1Br Salon Fiestas Break 1									
09:10-10:00 SuIP Salon Fiestas Special Panel									
10:00-10:15 SuCo1_Br Foyer 2nd Floor Coffee Break 1									
10:15-12:15 SuBCAP Salon Fiestas Best Conference and Application Paper Awards Session									
12:15-13:30 SuLuM_Br Bugambilias Lunch Break 2									
13:30-15:30 SuAM1 Constitucion A Additive Manufacturing	13:30-15:30 SuAM2 Constitucion B Cyber-Physical Production Systems and Industry 4.0 1	13:30-15:30 SuAM3 Constitucion C Estimation and Calibration	13:30-15:30 SuAM4 Imperio A Computer Vision for Manufacturing and Transportation 1	13:30-15:30 SuAM5 Imperio B Planning, Scheduling and Coordination 1	13:30-15:30 SuAM6 Imperio C Agricultural Automation 1	13:30-15:30 SuAM7 Colonia Automation at Micro-Nano Scales 1			
15:30-15:45 SuCo2_Br Foyer 2nd Floor Coffee Break 2									
15:45-17:45 SuBM1 Constitucion A Autonomous Vehicle Navigation	15:45-17:45 SuBM2 Constitucion B Computer Vision in Automation 1	15:45-17:45 SuBM3 Constitucion C Human Factors and Human-In-The-Loop	15:45-17:45 SuBM4 Imperio A Motion and Path Planning and Control 1	15:45-17:45 SuBM5 Imperio B Foundations of Automation and Optimal/Robust Control	15:45-17:45 SuBM6 Imperio C Semiconductor Manufacturing and Production Scheduling	15:45-17:45 SuBM7 Colonia Healthcare Management and Automation			

19:00-20:00 SuP2L Ballroom Laska Plenary II (Chengdu)			
20:00-21:00 SuP3L Ballroom Laska Plenary III (Chengdu)			
21:00-21:15 SuCo3_Br Room T8 Coffee Break 2 (Chengdu)			
	21:15-23:15 SuCC1 Aries 1 & 2 Automation at Micro-Nano Scales 2 (Chengdu)	21:15-23:15 SuCC2 Aries 3 Automation for Manufacturing and Logistics 2 (Chengdu)	21:15-23:15 SuCC3 Taurus Foundations of Automation 2 (Chengdu)
23:15-24:00 SuLuC2_Br MIX (first floor) Lunch Break 2 (Chengdu)			

CASE2022 Program at a Glance Monday August 22, 2022

Track M1	Track M2	Track M3	Track M4	Track M5	Track M6	Track M7	Track C1	Track C2	Track C3
00:00-01:00 MoLuC1_Br Room T8									
01:00-04:00 MoSA Room T9 Student Activities (Chengdu)									
05:30-07:30 MoBaC_Br Ballroom Laska Conference Banquet (Chengdu)									
08:00-09:00 MoP1L Salon Fiestas Plenary IV									
09:00-09:10 MoCo1_Br Foyer 2nd Floor Coffee Break 3									
09:10-10:10 MoIP11 Imperio A Industrial Panel 1					09:10-10:10 MoAw1H Salon Fiestas Best Healthcare Automation Paper Award Session				
10:10-11:10 MoIP22 Imperio A Industrial Panel 2					10:10-11:50 MoAw2S Salon Fiestas Best Student Paper Award Session				
12:00-13:30 MoLuM_Br Bugambilias Lunch Break 3									
13:30-15:30 MoAM1 Constitucion A Motion and Robot Control 1	13:30-15:30 MoAM2 Constitucion B Cyber-Physical Production Systems and Industry 4.0 2	13:30-15:30 MoAM3 Constitucion C Deep Learning in Robotics and Automation 1	13:30-15:30 MoAM4 Imperio A Computer Vision for Manufacturing and Transportation 2	13:30-15:30 MoAM5 Imperio B Planning, Scheduling and Coordination 2	13:30-15:30 MoAM6 Imperio C Agricultural Automation 2	13:30-15:30 MoAM7 Colonia Automation in Construction and Production			
15:30-15:45 MoCo2_Br Foyer 2nd Floor Coffee Break 4									
15:45-17:45 MoBM1 Constitucion A Industrial Robots	15:45-17:45 MoBM2 Constitucion B Computer Vision in Automation 2	15:45-17:45 MoBM3 Constitucion C Deep Learning in Robotics and Automation 2	15:45-17:45 MoBM4 Imperio A Motion and Path Planning and Control 2	15:45-17:45 MoBM5 Imperio B Intelligent and Flexible Manufacturing 1	15:45-17:45 MoBM6 Imperio C Machine Learning and Its Application	15:45-17:45 MoBM7 Colonia Learning and Adaptive Systems			
19:00-21:00 MoBaM_Br Salon Fiestas Conference Banquet							19:00-21:00 MoCC1 Aries 1 & 2 Simulation and AI (Chengdu)	19:00-21:00 MoCC2 Aries 3 Modeling, Control, and Scheduling of Robotized Manuf.acturing Syst. (Chengdu)	19:00-21:00 MoCC3 Taurus Deep Learning in Robotics and Automation 3 (Chengdu)

21:00-21:15 MoCo3_Br Room T8 Coffee Break 3 (Chengdu)			
	21:15-23:15 MoDC1 Aries 1 & 2 Smart Healthcare Services and Systems (Chengdu)	21:15-23:15 MoDC2 Aries 3 Manufacturing and Service Systems in the New Era 1 (Chengdu)	21:15-23:15 MoDC3 Taurus
23:15-24:00 MoLuC2_Br MIX (first floor) Lunch Break 3 (Chengdu)			

CASE2022 Program at a Glance Tuesday August 23, 2022

Track T1	Track T2	Track T3	Track T4	Track T5	Track T6	Track T7
00:00-01:00 TuLuC1_Br Room T8						
05:30-07:30 TuFC_Br MIX (first floor) Farewell Reception (Chengdu)						
08:00-09:00 TuPL Salon Fiestas Plenary V						
09:00-09:10 TuCo1_Br Salon Fiestas Break 2						
09:10-09:45 TuAwC Salon Fiestas Award Ceremony						
09:45-10:00 TuCo2_Br Foyer 2nd Floor Coffee Break 5						
10:00-12:00 TuAT1 Constitucion A Advances and New Challenges in Logistics and Transportation Systems	10:00-12:00 TuAT2 Constitucion B Machine Learning-Enabled Modeling Technology and Its Applications	10:00-12:00 TuAT3 Constitucion C Adaptive and Resilient Cyber-Physical Manufacturing Networks	10:00-12:00 TuAT4 Imperio A Advances of Machine Learning for Smart Manufacturing	10:00-12:00 TuAT5 Imperio B Manufacturing and Service Systems in the New Era 2	10:00-12:00 TuAT6 Imperio C Manufacturing Data Science	10:00-12:00 TuAT7 Colonia Manipulation Planning and Control
12:00-13:30 TuLuM_Br Bugambilias Lunch Break 4						
13:30-15:30 TuBT1 Constitucion A Motion and Robot Control 2	13:30-15:30 TuBT2 Constitucion B Recent Advances in Theory and Applications of Simulation-Based Optimization	13:30-15:30 TuBT3 Constitucion C Knowledge Representation and Reasoning for Autonomous Agents	13:30-15:30 TuBT4 Imperio A Motion and Path Planning and Control 3	13:30-15:30 TuBT5 Imperio B Planning, Scheduling and Coordination 3	13:30-15:30 TuBT6 Imperio C AI-Based Methods	13:30-15:30 TuBT7 Colonia Manufacturing, Maintenance and Supply Chains
15:30-15:45 TuCo3_Br Foyer 2nd Floor Coffee Break 6						
15:45-17:45 TuCT1 Constitucion A Control Architectures and Service Robotics	15:45-17:45 TuCT2 Constitucion B Collaborative Robots in Manufacturing	15:45-17:45 TuCT3 Constitucion C Factory Automation	15:45-17:45 TuCT4 Imperio A Motion and Path Planning and Control 4	15:45-17:45 TuCT5 Imperio B Intelligent and Flexible Manufacturing 2	15:45-17:45 TuCT6 Imperio C Wearable Robots and Soft Manipulation	15:45-17:45 TuCT7 Colonia Automation in Life Sciences and Human-In-The-Loop
19:00-21:00 TuFM_Br Salon Angel Farewell Reception						

Events

Lunch with Leaders

This Free luncheon is open to student and young professional attendees offering the chance to meet and interact with Leaders of RAS and/or Industry. Informal discussion over lunch will take place round table style, topics may vary from career advice, insights into field future, to general conversation to get to know Leaders in the field of automation science and engineering.

Leaders:

- Frank Park, Seoul National University, Korea, and President IEEE RAS
- Peter Luh, Trustees Distinguished Professor, University of Connecticut, USA
- Yu Sun, Professor of University of Toronto, Canada, EiC of IEEE TASE
- Mariagrazia Dotoli, Professor of Politecnico di Bari, Italy

Time: Sunday, 21 August, 12:00 - 13:30
Location: Salon Bugambilias

Women in Engineering Luncheon

This event will stimulate active discussion of the benefits of diversity and inclusion. In addition, we hope it will encourage networking among conference participants that will lead to new and varied collaborations for increased community engagement.
RAS WIE provides the opportunity to foster discussion on the role of women in robotics and automation, inspire girls and promote collaborations and initiatives to advance women in leadership. The goal for this event is to be more than a luncheon for women, but a luncheon with women, a diverse audience is encouraged. Therefore, men are more than welcome to participate and enjoy the discussion.
(Lunch with a 30-minute panel discussion followed by networking)

Title: ***The Benefits of "Diversity" in Research Teams***
Organizers: Lisset Salinas, Caleb Rascón, Wendy Aguilar, Oscar Carbajal
Invited Speakers:

- Cristina Verde, Universidad Nacional Autónoma de Mexico, UNAM, Mexico
- Frank Park, Seoul National University, Korea, and President IEEE RAS

Time: Monday, 22 August, 12:00 - 13:30
Location: Imperio A

Job Opportunities in Industry Luncheon

This is a 30-minute online presentation during lunch time. The speakers will present the job opportunities in Industry for graduated students in the areas of software development, ADAS, embedded systems, autonomous vehicles, among others. The jobs are in Mexico and other regions of the world.
Time: Tuesday, 23 August, 13:00 - 13:30
Location: Imperio A

Award Finalists

Best Conference and Application Paper

[1] Sarkar, Soumyendu; Gundecha, Vineet; Ghorbanpour, Sahand; Shmakov, Alexander; Ramesh Babu, Ashwin; Pichard, Alexandre; cocho, Mathieu, *Skip Training for Multi-Agent Reinforcement Learning Controller for industrial wave energy converters*

[2] Gilles, Maximilian; Chen, Yuhao; Winter, Tim Robin; Zeng, E Zhixuan; Wong, Alexander, *MetaGraspNet: A Large-Scale Benchmark Dataset for Scene-Aware Ambidextrous Bin Picking via Physics-based Metaverse Synthesis*

[3] Bi, Mingjie; Chen, Gongyu; Tilbury, Dawn; Shen, Siqian; Barton, Kira, *A Model-based Multi-agent Framework to Enable an Agile Response to Supply Chain Disruptions*

[4] Presten, Mark; Parikh, Rishi; Aeron, Shrey; Mukherjee, Sandeep; Adebola, Simeon Oluwafunmilore; Sharma, Satvik; Theis, Mark; Teitelbaum, Walter; Goldberg, Ken, *Automated Pruning of Polyculture Plants*

[5] Li, Zhihao; Xu, Wenjun; Liu, Jiayi; Cui, Jia; Hu, Yang, *Digital Twin-based Virtual Reconfiguration Method for Mixed-model Robotic Assembly Line*

[6] Suemitsu, Issei; Bhamgara, Hanoz; Utsugi, Kei; Hashizume, Jiro; Ito, Kiyoto, *Fast Simulation-based Order Sequence Optimization Assisted by Pre-trained Bayesian Recurrent Neural Network*

Best Student Paper

[1] PremRaj Kala, Ashish Kumar, Vipul Sanap, Laxmidhar Behera, *Towards Object Agnostic and Robust 4-DoF Table-Top Grasping*

[2] Xiaomeng Peng, Xiaoning Jin, Duan shiming, Chaitanya Sankavaram, *Robust Physics Guided Data-Driven Fleet Battery Pack Fault Detection under Dynamic Operating Conditions*

[3] Lawrence Yunliang Chen, Huang Huang, Michael Danielczuk, Jeffrey Ichnowski, Ken Goldberg, *Optimal Shelf Arrangement to Minimize Robot Retrieval Time*

[4] Jiaxu Song, Juan Wu, Kaiyan Yu, *3D Pose Identification of Moving Micro and Nanowires in Fluid Suspensions under Bright-Field Microscopy*

[5] Jiaqi Jiang, Guanqun Cao, Thanh-Toan Do, Shan Luo, *A4T: Hierarchical Affordance Detection for Transparent Objects Depth Reconstruction and Manipulation*

Best Healthcare Automation Paper

[1] Zhou, Siqiong; Pfeiffer, Nicholaus; Islam, Upala; Banerjee, Imon; Patel, Bhavika; Iquebal, Ashif, *Generating Counterfactual Explanations for Causal Inference in Breast Cancer Treatment Response*

[2] An, Yu; CHEN, SHANEN; Zhang, Xi, *A physiological status diagnosis method using tensor-based regularization*

[3] Chen, Suhao; Wang, Zekai; Yao, Bing; Liu, Tieming, *Prediction of Diabetic Retinopathy Using Longitudinal Electronic Health Records*

Content List

CASE20222 Technical Program for Saturday August 20, 2022

19:20-19:40	SaAC2.2
Cognition-Driven Robot Decision Making Method in Human-Robot Collaboration Environment	
Zhang, Rong	Donghua University
Li, Xinyu	Donghua University
Zheng, Yu	Shanghai Jiao Tong University
Lv, Jianhao	Donghua University
Li, Jie	Donghua University
Zheng, Pai	The Hong Kong Polytechnic University
Bao, Jinsong	College of Mechanical Engineering, Donghua University

19:40-20:00	SaAC2.3
An Efficient Approach for Solving Robotic Task Sequencing Problems Considering Spatial Constraint	
Li, Donghui	Institute of Automation, Chinese Academy of Sciences, University
Wang, Qingbin	Institute of Automation, Chinese Academy of Sciences
Zou, Wei	Chinese Academy of Sciences, University of Chinese Academy of Sci
Su, Hu	Institute of Automation, Chinese Academy of Science
Wang, Xingang	Research Center of Precision Sensing and Control, Institute of A
Xu, Xinyi	Chinese Ordnance Navigation and Control Technology Research Insi

20:00-20:20	SaAC2.4
Leader-Follower Based Two-AGV Cooperative Transportation System in 5G Environment	
Fu, Xuke	Xi'an Jiaotong Universtiy
Wang, Deming	Xi'an Jiaotong University
Hu, Jianchen	Xi'an Jiaotong University
Wei, Junhu	Xi'an Jiaotong University
Yan, Chao-Bo	Xi'an Jiaotong University

20:20-20:40	SaAC2.5
Multi-Product Multi-Warehouse Delivery Problem under Inventory Constraints	
Cao, Tirui	Tsinghua University
Luo, Xue	Tsinghua University
Wang, Chen	Tsinghua University
Wan, Yilei	Alibaba Group
Zhao, Lei	Tsinghua University

20:40-21:00	SaAC2.6
Multi-Thread CTAEA-Based Workstation Reconfiguration for Multi-Stage Automobile Engine Flow Shop Considering Performance Deterioration	
Yang, Miao	Chongqing University
Li, Congbo	Chongqing University
Wu, Wei	University of Hong Kong
Zhang, You	Chongqing University
Chang, Yongsheng	Chongqing Changan Automobile Co., Ltd

SaAC3	Taurus
Foundations of Automation 1 (Chengdu) (Regular Session)	
Chair: Zhao, Qianchuan	Tsinghua University
Co-Chair: Qin, Wei	Shanghai Jiao Tong University

19:00-19:20	SaAC3.1
A Dynamic Programming-Based Slot Reservation Method for Non-Clear Containers in Automated Container Terminals	
Zhu, Jiyue	Shanghai Jiaotong University
Lee, Wei Lian William	Shanghai Jiaotong University
Qin, Wei	Shanghai Jiao Tong University

19:20-19:40	SaAC3.2
Collaborative Scheduling Optimization of Equipment in Multimodal Transport Harbor Considering Hybrid Operation Mode of "train-Yard-Vessel" and "train-Vessel" , pp. 86-91.	
Li, Wenfeng	Wuhan University of Technology
Wu, Ziteng	Wuhan University of Technology
Yang, Pengfei	Wuhan University of Technology
Cai, Lei	Wuhan University of Technology

19:40-20:00	SaAC3.3
Data-Centric Workshop Digital Twin Conceptual Modeling Method and Application	
Jiqi, Li	Donghua University
Guohua, Liu	Donghua University

20:00-20:20	SaAC3.4
Digital Twin Based Scheduling Method for Marine Equipment Material Transportation Vehicles	
Shen, Xingwang	Donghua University
Liu, Shimin	Donghua University
Zhou, Bin	Donghua University
Zheng, Yu	Shanghai Jiao Tong University
Bao, Jinsong	College of Mechanical Engineering, Donghua University

20:20-20:40	SaAC3.5
A Novel Distributed Optimal Dynamic Duct Static Pressure Method in Multi-Zone Variable Air Volume Systems	
Wang, Xuetao	Tsinghua University
Zhao, Qianchuan	Tsinghua University
Wang, Yifan	Tsinghua University
Yan, Hu	Tsinghua University

20:40-21:00	SaAC3.6
A Computing Budget Allocation Method for Minimizing EV Charging Cost Using Uncertain Wind Power	
Jiang, Zhaoyu	Tsinghua University
Jia, Qing-Shan	Tsinghua University
Guan, Xiaohong	Xi'an Jiaotong University

SaBC1	Aries 1& 2
Human-Robot Collaboration for Futuristic Human-Centric Smart Manufacturing (Chengdu) (Special Session)	
Chair: Zheng, Pai	The Hong Kong Polytechnic University
Co-Chair: Qiao, Fei	Tongji University
Organizer: Zheng, Pai	The Hong Kong Polytechnic University
Organizer: Bao, Jinsong	DongHua University
Organizer: Peng, Tao	Zhejiang University
Organizer: Xu, Wenjun	Wuhan University of Technology
Organizer: Liu, Yongkui	Xidian University
Organizer: Wang, Xi Vincent	KTH Royal Institute of Technology
Organizer: Liu, Ying	Cardiff University
Organizer: Wang, Lihui	KTH Royal Institute of Technology

21:15-21:35	SaBC1.1
A Meta-Reinforcement Learning-Based Adaptive Robot Control for Human-Robot Collaboration in Personalized Production	
Kwok, Hin Chi	The Hong Kong Polytechnic University
Li, Chengxi	The Hong Kong Polytechnic University
Pang, YatMing	The Hong Kong Polytechnic University
Zheng, Pai	The Hong Kong Polytechnic University
21:35-21:55	SaBC1.2
Dynamic Task Reallocation in Human-Robot Collaborative Workshop Based on Online Biotic Fatigue Detection	
Li, Xinyu	Wuhan University of Technology
Xu, Wenjun	Wuhan University of Technology
Yao, Bitao	Wuhan University of Technology
Ji, Zhenrui	Wuhan University of Technology
Liu, Xuedong	School of Information Engineering, Wuhan University of Technolog
21:55-22:15	SaBC1.3
Early Prediction of Turn-Taking Based on Spiking Neuron Network to Facilitate Human-Robot Collaborative Assembly	
Feng, Siqi	Wuhan University of Technology
Xu, Wenjun	Wuhan University of Technology
Yao, Bitao	Wuhan University of Technology
Liu, Zhihao	Wuhan University of Technology
Ji, Zhenrui	Wuhan University of Technology
22:15-22:35	SaBC1.4
Human–Machine Collaborative Decision-Making Method Based on Confidence for Smart Workshop Dynamic Scheduling	
Wang, Dongyuan	Tongji University
Qiao, Fei	Tongji University
Guan, Liuen	Tongji University
Liu, Juan	Tongji University
Ding, Chen	Tongji University
22:35-22:55	SaBC1.5
Point Cloud Extraction of Aircraft Skin Butt Joint Based on Adaptive Matching Calibration Algorithm	
Wen, Zhihui	Nanchang Hangkong University
Xia, Guisuo	Nanchang Hangkong University
Liu, Fang	Nanchang Hangkong University
Wei, Mengjun	Nanchang Hangkong University
He, Yizhen	Nanchang Hangkong University
Chen, Feng	Nanchang Hangkong University
Liu, Wandong	Nanchang Hangkong University

SaBC2	Aries 3
Data Analytics and Optimization for Manufacture-Circulation Industrial System (Chengdu) (Special Session)	
Chair: Wang, Gongshu	Northeastern University
Co-Chair: Yang, Yang	Institute of Industrial and Systems Enginnering, Northeastern University
Organizer: Wang, Gongshu	Northeastern University
Organizer: Yang, Yang	Northeastern University
Organizer: Su, Lijie	Northeastern University
Organizer: Tang, Lixin	Northeastern University
21:15-21:35	SaBC2.1
An Efficient Heuristic Algorithm for Flexible Job-Shop Scheduling Problem with Due Windows	
Ai, Yi	Xi'an Jiaotong University
Wang, MengYing	Xi'an Jiaotong University
Xue, Xiaoguang	Beijing Special Engineering and Design Institute
Yan, Chao-Bo	Xi'an Jiaotong University
21:35-21:55	SaBC2.2
Diversity Guided Production Inventory Control in Automobile Manufacturers	
Tao, Lue	Northeastern University
Chen, Weihua	BMW Brilliance Automotive Ltd
Wang, Gongshu	Northeastern University
Su, Lijie	Northeastern University
Yang, Yang	Northeastern University
Dong, Yun	Liaoning Engineering Laboratory of Data Analytics and Optimizati
21:55-22:15	SaBC2.3
Balancing Production Capacity of Steelmaking by Considering the Demands of Downstream Processes	
Wang, Gongshu	Northeastern University
Liu, Sibo	Northeastern University
Lin, Yujun	Data Analytics and Optimization
22:15-22:35	SaBC2.4
Capacitated Lot Sizing Problem with Family-Based Setup and Downstream Processes-Based Demand	
Zhao, Yuming	Frontier Science Center for Industrial Intelligence and Systems
Wang, Gongshu	Northeastern University
Yang, Yang	Northeastern University
Su, Lijie	Northeastern University
22:35-22:55	SaBC2.5
Modeling, Analysis, and Improvement of Batch-Discrete Manufacturing Systems: A Systems Approach	
Liu, Lingchen	Xi'an Jiaotong University
Yan, Chao-Bo	Xi'an Jiaotong University
Li, Jingshan	Tsinghua University
22:55-23:15	SaBC2.6
AB&B an Anytime Branch and Bound Algorithm for Scheduling of Deadlock-Prone Flexible Manufacturing Systems	
Yin, Pei	Northwestern Polytechnical University
Luo, JianChao	Research & Development Institute of Northwestern Polytechnical U
Zhou, MengChu	New Jersey Institute of Technology

SaBC3	Taurus
Machine Learning and AIs for Quality & Reliability Assessment and Enhancement (Chengdu) (Special Session)	
Chair: Zhang, Xi	College of Engineering, Peking University
Co-Chair: Qin, Wei	Shanghai Jiao Tong University
Organizer: Zhang, Xi	College of Engineering, Peking University

Organizer: Liu, Yu — University of Electronic Science and Technology of China

21:15-21:35 SaBC3.1

Double-Robust Bayesian Process Optimization with Spherically Symmetric Errors

Ouyang, Linhan — Nanjing University of Aeronautics and Astronautics

21:35-21:55 SaBC3.2

Classification Based Hard Disk Drive Failure Prediction: Methodologies, Performance Evaluation and Comparison

Xu, Ruiyu — Peking University
Wang, Xinming — Peking University
Wu, Jianguo — Peking University

21:55-22:15 SaBC3.3

High-Dimensional Categorical Process Monitoring Via Multiscale Pattern Mining and Testing

Wang, Kai — Xi'an Jiaotong University

22:15-22:35 SaBC3.4

Maintenance Optimization of Multicomponent Systems Using Reinforcement Learning

Zhou, Yifan — Southeast University
Li, Bangcheng — Southeast University

22:35-22:55 SaBC3.5

Causality-Based Prediction Method for the Diesel Engine Assembly System

Hu, Jinhua — Shanghai JiaoTong University
Sun, Yanning — Shanghai Jiao Tong University
Xu, Hongwei — Shanghai Jiao Tong University
Zhang, Zhanluo — Shanghai Jiao Tong University
Qin, Wei — Shanghai Jiao Tong University
Li, Xinyu — Huazhong University of Science and Technology

22:55-23:15 SaBC3.6

Constraint Linear Model for Period Estimation and Sparse Feature Extraction Based on Iterative Likelihood Ratio Test

Li, Yongxiang — Shanghai Jiao Tong University

CASE2022 Technical Program for Sunday August 21, 2022

SuWCC2 — Aries 1 & 2
Workshop 5 (Chengdu) (Workshop Session)

01:00-04:00 SuWCC2.1

Semiconductor Smart Manufacturing Technology Workshop

Qiao, Yan — Macau University of Science and Technology
Liu, Bin — IKAS Industries (Guangdong) Company, Ltd

SuWCC3 — Aries 3
Workshop 6 (Chengdu) (Workshop Session)

01:00-04:00 SuWCC3.1

Robot Teams: Challenges, Models, and Methodologies.

Haibin, Zhu — Nipissing University
Zhang, Junqi — Tongji Univ

SuP1L — Salon Fiestas
Plenary I (Plenary Session)

Chair: Li, Xiaoou — Center of Research and Advanced Studies of NationalPolytechnic Institute (CINVESTAV-IPN)

08:00-09:00 SuP1L.1

Robotic Manipulation: Sense, Touch, and Learn.

Wang, Michael Yu — Hong Kong University of Science & Technology

SuIP — Salon Fiestas
Special Panel (Plenary Session)

Chair: Lennartson, Bengt — Chalmers University of Technology

09:10-10:00 SuIP.1

Panel Discussion on Machine Learning for Automation.

Lennartson, Bengt — Chalmers University of Technology

SuBCAP — Salon Fiestas
Best Conference and Application Paper Awards Session (Special Session)

Chair: Luh, Peter — University of Connecticut

10:15-10:35 SuBCAP.1

Skip Training for Multi-Agent Reinforcement Learning Controller for Industrial Wave Energy Converters

Sarkar, Soumyendu — Hewlett Packard Enterprise
Gundecha, Vineet — Hewlett Packard Enterprise
Ghorbanpour, Sahand — Hewlett Packard Enterprise
Shmakov, Alexander — HPE Labs
Ramesh Babu, Ashwin — Hewlett Packard Enterprise Labs
Pichard, Alexandre — Carnegie Clean Energy
Cocho, Mathieu — Carnegie Clean Energy

10:35-10:55 SuBCAP.2

MetaGraspNet: A Large-Scale Benchmark Dataset for Scene-Aware Ambidextrous Bin Picking Via Physics-Based Metaverse Synthesis

Gilles, Maximilian — Karlsruhe Institute of Technology
Chen, Yuhao — University of Waterloo
Winter, Tim Robin — Karlsruhe Institute of Technology
Zeng, E Zhixuan — University of Waterloo
Wong, Alexander — University of Waterloo

10:55-11:15 SuBCAP.3

Digital Twin-Based Virtual Reconfiguration Method for Mixed-Model Robotic Assembly Line

Li, Zhihao	Wuhan University of Technology
Xu, Wenjun	Wuhan University of Technology
Liu, Jiayi	Wuhan University of Technology
Cui, Jia	Wuhan University of Technology, School of Information Engi
Hu, Yang	China Ship Development and Design Center

11:15-11:35 SuBCAP.4

A Model-Based Multi-Agent Framework to Enable an Agile Response to Supply Chain Disruptions

Bi, Mingjie	University of Michigan
Chen, Gongyu	University of Michigan, Ann Arbor
Tilbury, Dawn	University of Michigan
Shen, Siqian	University of Michigan
Barton, Kira	University of Michigan at Ann Arbor

11:35-11:55 SuBCAP.5

Automated Pruning of Polyculture Plants

Presten, Mark	University of California, Berkeley
Parikh, Rishi	University of California Berkeley
Aeron, Shrey	University of California, Berkeley
Mukherjee, Sandeep	University of California, Berkeley
Adebola, Simeon Oluwafunmilore	University of California, Berkeley
Sharma, Satvik	University of California, Berkeley
Theis, Mark	University of California
Teitelbaum, Walter	UC Santa Cruz
Goldberg, Ken	UC Berkeley

11:55-12:15 SuBCAP.6

Fast Simulation-Based Order Sequence Optimization Assisted by Pre-Trained Bayesian Recurrent Neural Network

Suemitsu, Issei	Hitachi, Ltd
Bhamgara, Hanoz	Hitachi Ltd
Utsugi, Kei	Hitachi Ltd
Hashizume, Jiro	Hitachi, Ltd
Ito, Kiyoto	Research and Development Group, Hitachi, Ltd

SuAM1 Constitucion A

Additive Manufacturing (Regular Session)

Chair: Huang, Qiang	University of Southern California
Co-Chair: Mettu, Ramgopal	Tulane University

13:30-13:50 SuAM1.1

A Deep-Learning-Based Surrogate Model for Thermal Signature Prediction in Laser Metal Deposition

Guo, Shenghan	Arizona State University
Guo, Weihong	Rutgers University
Bian, Linkan	Mississippi State University
Guo, Yuebin	Rutgers University

13:50-14:10 SuAM1.2

Small-Sample Learning of 3D Printed Thin-Wall Structures Using Printing Primitives

Wang, Yuanxiang	University of Southern California
Huang, Qiang	University of Southern California

14:10-14:30 SuAM1.3

A Reeb Graph Approach for Faster 3D Printing

Khatkar, Jayant	University of Technology Sydney
Clemon, Lee	University of Technology Sydney
Fitch, Robert	University of Technology Sydney
Mettu, Ramgopal	Tulane University

14:30-14:50 SuAM1.4

Investigating Statistical Correlation between Multi-Modality In-Situ Monitoring Data for Powder Bed Fusion Additive Manufacturing

Yang, Zhuo	Georgetown University
Adnan, Muhammad	National Cheng Kung University, Institute of Manufacturing Infor
Lu, Yan	National Institute of Technology and Standards
Cheng, Fan-Tien	National Cheng Kung University
Yang, Haw-Ching	National Kaohsiung Univ. of Sci. and Tech
Perisic, Milica	NIST
Ndiaye, Yande	NIST

14:50-15:10 SuAM1.5

Spatiotemporal Monitoring of Melt-Pool Variations in Metal-Based Additive Manufacturing

Yang, Hui	The Pennsylvania State University
Zhang, Siqi	Pennsylvania State University
Lu, Yan	National Institute of Technology and Standards
Witherell, Paul	NIST
Kumara, Soundar	The Pennsylvania State University

15:10-15:30 SuAM1.6

Online Coordinated Motion Control of a Redundant Robotic Wire Arc Additive Manufacturing System

Lizarralde, Nicolas	Federal University of Rio De Janeiro
Coutinho, Fernando	Federal University of Rio De Janeiro
Lizarralde, Fernando	Federal University of Rio De Janeiro

SuAM2 Constitucion B

Cyber-Physical Production Systems and Industry 4.0 1 (Regular Session)

Chair: Ju, Feng	Arizona State University
Co-Chair: Kovalenko, Ilya	Pennsylvania State University

13:30-13:50 SuAM2.1

Decentralized Factory Control Based on Multi-Agent Technologies

Bidmead, Jonathan	University of Auckland
Bhatiani, Sahil	University of Auckland
Xu, Xun	University of Auckland

13:50-14:10 SuAM2.2

SWAP-IT: A Scalable and Lightweight Industry 4.0 Architecture for Cyber-Physical Production Systems

Luensch, Dennis	Fraunhofer Institute for Material Flow and Logistics
Detzner, Peter	Fraunhofer Institute for Material Flow and Logistics
Ebner, Andreas	Fraunhofer-Institut Für Optronik, Systemtechnik Und Bildauswertu
Kerner, Sören	Fraunhofer Institute for Material Flow and Logistics

14:10-14:30 SuAM2.3

Identifying Inconsistencies in the Design of Large-Scale Casting Systems – an Ontology-Based Approach

Ji, Fan	Technical University of Munich
Ocker, Felix	Technical University of Munich
Zou, Minjie	Technical University of Munich
Vogel-Heuser, Birgit	Technical University Munich
Oligschläger, Marius	SMS Group GmbH

14:30-14:50 SuAM2.4

A Novel Implementation Framework of Digital Twins for Intelligent Manufacturing Based on Container Technology and Cloud Manufacturing Services

Hung, Min-Hsiung	Chinese Culture University
Lin, Yu-Chuan	National Cheng Kung University
Hsiao, Hung-Chang	National Cheng Kung University
Chen, Chao-Chun	National Cheng Kung University
Lai, Kuan-Chou	Department of Computer Science and Information Engineering, Nati
Hsieh, Yu-Ming	National Cheng Kung University, Institute of Manufacturing Infor
Hao, Tieng	National Cheng Kung University
Tsai, Tsung-Han	National Cheng Kung University
Huang, Hsien-Cheng	National Cheng Kung University
Yang, Haw-Ching	National Kaohsiung Univ. of Sci. and Tech
Cheng, Fan-Tien	National Cheng Kung University

14:50-15:10 SuAM2.5

An Integrated Framework for Dynamic Manufacturing Planning to Obtain New Line Configurations

Poudel, Laxmi	University of Michigan
Kovalenko, Ilya	Pennsylvania State University
Geng, Ruijie	University of Michigan
Matsui, Takaharu	Hitachi America, Ltd
Nonaka, Youichi	Hitachi
Nakano, Takahiro	HITACHI
Umeda, Shota	Hitachi, Ltd
Tilbury, Dawn	University of Michigan
Barton, Kira	University of Michigan at Ann Arbor

15:10-15:30 SuAM2.6

A Communication Architecture to Observe and Partially Preserve Efficiency in Automated Production Systems

Wilch, Jan	Technical University of Munich
Vogel-Heuser, Birgit	Technical University Munich
Hsieh, Yu-Ming	National Cheng Kung University, Institute of Manufacturing Infor
Cheng, Fan-Tien	National Cheng Kung University

SuAM3 Constitucion C

Estimation and Calibration (Regular Session)

Chair: Song, Dezhen	Texas A&M University
Co-Chair: Sridharan, Mohan	University of Birmingham

13:30-13:50 SuAM3.1

Design of an Object Scanning System and a Calibration Method for a Fingertip-Mounted Dual-Modal and Dual Sensing Mechanisms (DMDSM)-Based Pretouch Sensor for Grasping

Wang, Di	Texas A&M University
Guo, Fengzhi	Texas A&M University
Fang, Cheng	Texas A&M University
Zou, Jun	Texas A&M University
Song, Dezhen	Texas A&M University

13:50-14:10 SuAM3.2

An Easy Hand-Eye Calibration Method for Laser Profile Scanners in High Precision Applications Using Optimized View Poses

Paschke, Udo	Fraunhofer IPA
Landgraf, Christian	Fraunhofer IPA
Ernst, Kilian	Fraunhofer IPA
Stoll, Johannes T.	Fraunhofer Institute for Manufacturing Engineering and Automatio
Kraus, Werner	Fraunhofer IPA

14:10-14:30 SuAM3.3

Estimating the Center of Mass of an Unknown Object Via Dynamic Pushing

Gao, Ziyan	Japan Advanced Institute of Science and Technology
Elibol, Armagan	Japan Advanced Institute of Science and Technology
Chong, Nak Young	Japan Advanced Institute of Science and Technology

14:30-14:50 SuAM3.4

Shape Estimation of a 3D Printed Soft Sensor Using Multi-Hypothesis Extended Kalman Filter

Tan, Kaige	KTH Royal Institute of Technology
Ji, Qinglei	KTH Royal Institute of Technology
Feng, Lei	KTH Royal Institute of Technology
Torngren, Martin	KTH Royal Institute of Technology

14:50-15:10 SuAM3.5

MuCaSLAM: CNN-Based Frame Quality Assessment for Mobile Robot with Omnidirectional Visual SLAM.

Karpyshev, Pavel	Skolkovo Institute of Science and Technology
Kruzhkov, Evgeny	Skoltech
Yudin, Evgeny	Skoltech
Savinykh, Alena	Skolkovo Institute of Science and Technology
Potapov, Andrei	Skolkovo Institute of Science and Technology
Kurenkov, Mikhail	Skolkovo Institute of Science and Technology
Kolomeytsev, Anton	Skolkovo Institute of Science and Technology
Kalinov, Ivan	Skolkovo Institute of Science and Technology
Tsetserukou, Dzmitry	Skolkovo Institute of Science and Technology

15:10-15:30 SuAM3.6

A Keypoint-Based Object Representation for Generating Task-Specific Grasps

Robson, Mark	University of Birmingham
Sridharan, Mohan	University of Birmingham

SuAM4 Imperio A

Computer Vision for Manufacturing and Transportation 1 (Regular Session)

Chair: Zhang, Yuming	University of Kentucky
Co-Chair: Yu, Wen	CINVESTAV-IPN

13:30-13:50 SuAM4.1

In-Hand Pose Estimation and Pin Inspection for Insertion of Through-Hole Components

Hagelskjær, Frederik	University of Southern Denmark
Kraft, Dirk	University of Southern Denmark

13:50-14:10 SuAM4.2

SingleDemoGrasp: Learning to Grasp from a Single Image Demonstration

Mehman Sefat, Amir	Tampere University
Angleraud, Alexandre	Tampere University
Rahtu, Esa	University of Oulu
Pieters, Roel S.	Tampere University

14:10-14:30 SuAM4.3

Analysis of Paint Film Thickness Distribution Based on Particle Method Considering Time Series Change of Flow

Takahashi, Yoshinobu	Waseda University
Chang, Fangshou	Waseda University
Kato, Fumihiro	Waseda University
Iwata, Hiroyasu	Waseda University

14:30-14:50 SuAM4.4

Self-Supervised Deep Visual Servoing for High Precision Peg-In-Hole Insertion

Haugaard, Rasmus Laurvig	University of Southern Denmark
Buch, Anders Glent	University of Southern Denmark
Iversen, Thorbjørn Mosekjær	The Maersk Mc-Kinney Moller Institute, University of Southern De

14:50-15:10 SuAM4.5

Contrastive Learning of Features between Images and LiDAR

Jiang, Peng	Texas A&M University
Saripalli, Srikanth	Texas A&M

15:10-15:30 SuAM4.6

How to Accurately Monitor the Weld Penetration from Dynamic Weld Pool Serial Images Using CNN-LSTM Deep Learning Model?

Yu, Rui	University of Kentucky
Kershaw, Joseph	Case Western Reserve University
Wang, Peng (Edward)	University of Kentucky
Zhang, Yuming	University of Kentucky

SuAM5 Imperio B

Planning, Scheduling and Coordination 1 (Regular Session)

Chair: Julius, Agung	Rensselaer Polytechnic Institute
Co-Chair: Yu, Wen	CINVESTAV-IPN

13:30-13:50 SuAM5.1

Path Planning for 3-D In-Hand Dexterous Micro-Manipulation in Presence of Adhesion Forces

Tchouatat Kepseu, Ivan	Universite Bourgogne Franche-Comte
Gauthier, Michael	FEMTO-ST Institute
Dahmouche, Redwan	Université De Franche Comté

13:50-14:10 SuAM5.2

Distributed Consensus-Based Online Monitoring of Robot Swarms with Temporal Logic Specifications

Yan, Ruixuan	Rensselaer Polytechnic Institute
Julius, Agung	Rensselaer Polytechnic Institute

14:10-14:30 SuAM5.3

Heterogeneous Multi-Robot Task Scheduling Heuristics for Garment Mass Customization

Bezerra, Ranulfo	Tohoku University
Ohno, Kazunori	Tohoku University
Kojima, Shotaro	Tohoku University
Aryadi, Hanif	Tohoku University
Gunji, Kenta	Tohoku University
Kuwahara, Masao	Tohoku University
Okada, Yoshito	Tohoku University
Konyo, Masashi	Tohoku University
Tadokoro, Satoshi	Tohoku University

14:30-14:50 SuAM5.4

Load-Haul Cycle Segmentation with Hidden Semi-Markov Models

Markham, Georgia	The University of Sydney
Seiler, Konstantin M	The University of Sydney
Balamurali, Mehala	University of Sydey
Hill, Andrew John	University of Sydney

14:50-15:10 SuAM5.5

A Low-Complexity and High-Performance Energy Management Strategy of a Hybrid Electric Vehicle by Model Approximation

Liu, Tong	KTH Royal Institute of Technology
Zhu, Wenyao	KTH Royal Institute of Technology
Tan, Kaige	KTH Royal Institute of Technology
Liu, Mingwei	KTH Royal Institute of Technology
Feng, Lei	KTH Royal Institute of Technology

15:10-15:30 SuAM5.6

Algorithm and System for Robotic Micro-Dose Herbicide Spray for Precision Weed Management

Hu, Chengsong	Texas A&M University
Xie, Shuangyu	Texas A&M University
Song, Dezhen	Texas A&M University
Thomasson, J. Alex	Mississippi State University
Hardin IV, Robert G.	Texas A&M University
Bagavathiannan, Muthukumar	Texas A&M University

SuAM6 Imperio C

Agricultural Automation 1 (Regular Session)

Chair: Meng, Xiangyu	Louisiana State University
Co-Chair: Han, Feng	Rutgers University

13:30-13:50 SuAM6.1

Fruit Mapping with Shape Completion for Autonomous Crop Monitoring

Marangoz, Salih	University of Bonn
Zaenker, Tobias	University of Bonn
Menon, Rohit	University of Bonn
Bennewitz, Maren	University of Bonn

13:50-14:10 SuAM6.2

Position-Agnostic Autonomous Navigation in Vineyards with Deep Reinforcement Learning

Martini, Mauro	Politecnico Di Torino
Cerrato, Simone	Politecnico Di Torino
Salvetti, Francesco	Politecnico Di Torino
Angarano, Simone	Politecnico Di Torino

Chiaberge, Marcello	Politecnico Di Torino

14:10-14:30 SuAM6.3

Eco-Driving of Autonomous Vehicles for Non-Stop Crossing of Signalized Intersections

Meng, Xiangyu	Louisiana State University
Cassandras, Christos G.	Boston University

14:30-14:50 SuAM6.4

Produce Harvesting by Laser Stem-Cutting

Sorour, Mohamed	Norwegian University of Life Sciences NMBU
From, Pål Johan	Norwegian University of Life Sciences
Elgeneidy, Khaled	University of Lincoln
Kanarachos, Stratis	Frederick University
Sallam, Mohamed	Helwan University

14:50-15:10 SuAM6.5

Environment-Aware Interactive Movement Primitives for Object Reaching in Clutter

Mghames, Sariah	University of Lincoln
Hanheide, Marc	University of Lincoln

15:10-15:30 SuAM6.6

Scheduling Landing and Payload Switch of Unmanned Aerial Vehicles on a Single Automatic Platform

Ausonio, Elena	University of Genoa
Bagnerini, Patrizia	University of Genoa
Gaggero, Mauro	National Research Council of Italy

SuAM7 Colonia

Automation at Micro-Nano Scales 1 (Regular Session)

Chair: Zefran, Milos	University of Illinois at Chicago
Co-Chair: Yu, Kaiyan	Binghamton University

13:30-13:50 SuAM7.1

FastPivot: An Algorithm for Inverse Problems

Guan, Yuling	University of Southern California
Li, Ang	University of Southern California
Koenig, Sven	University of Southern California
Haas, Stephan	University of Southern California
Kumar, T. K. Satish	University of Southern California

13:50-14:10 SuAM7.2

Informed Sampling-Based Motion Planning for Manipulating Multiple Micro Agents Using Global External Electric Fields

Li, Xilin	Binghamton University
Wu, Juan	Binghamton University
Song, Jiaxu	Binghamton University
Yu, Kaiyan	Binghamton University

14:10-14:30 SuAM7.3

Group-Based Control of Large-Scale Micro-Robot Swarms with On-Board Physical Finite-State Machines

Li, Siyu	University of Illinois at Chicago
Zefran, Milos	University of Illinois at Chicago
Paprotny, Igor	University of Illinois at Chicago

14:30-14:50 SuAM7.4

Robust Control of a Bimorph Piezoelectric Robotic Manipulator Considering Ellipsoidal-Type State Restrictions

Moreno-Guzman, Francisco	UPIBI-IPN
Salgado, Ivan	National Polytechnique Institute UPIBI
Cruz-Ortiz, David	National Polytechnique Institute UPIBI
Chairez, Isaac	UPIBI-IPN

14:50-15:10 SuAM7.5

A Reactive Energy-Aware Rendezvous Planning Approach for Multi-Vehicle Teams

Chour, Kenny	Texas A&M University
Reddinger, Jean-Paul	DEVCOM Army Research Laboratory,
Dotterweich, James	Engility Corp
Childers, Marshal	DEVCOM Army Research Laboratory
Humann, James	DEVCOM Army Research Laboratory,
Rathinam, Sivakumar	TAMU
Darbha, Swaroop	TAMU

SuBM1 Constitucion A

Autonomous Vehicle Navigation (Regular Session)

Chair: Song, Dezhen	Texas A&M University
Co-Chair: Incremona, Gian Paolo	Politecnico Di Milano

15:45-16:05 SuBM1.1

Scan Matching and Probabilistic Stationary Global Localization in an Airport Environment

Hoj, Henning Si	Technical University of Denmark
Christensen, Henrik Iskov	UC San Diego
Hansen, Søren	Automation and Control Group, Department of Electrical Engineeri
Svanebjerg, Elo	Vestergaard Company

16:05-16:25 SuBM1.2

Priority Tracking of Pedestrians for Self-Driving Cars

Nino, Jose	Cornell University
Campbell, Mark	Cornell University

16:25-16:45 SuBM1.3

Sliding Mode Control of an Autonomous Ground Vehicle Via Flatness Based Feedback Linearization

Bascetta, Luca	Politecnico Di Milano
Incremona, Gian Paolo	Politecnico Di Milano
Della Rossa, Fabio	Politecnico Di Milano
Dercole, Fabio	Politecnico Di Milano

16:45-17:05 SuBM1.4

A Deep Q Learning-Model Predictive Control Approach to Vehicle Routing and Control with Platoon Constraints

Giannini, Francesco	Università Della Calabria
Fortino, Giancarlo	Università Della Calabria
Franzè, Giuseppe	University of Calabria
Pupo, Francesco	Università Della Calabria

17:05-17:25 SuBM1.5

Improving Ego-Velocity Estimation of a Low-Cost 2D Doppler Radar for Vehicles by Recognizing Background and Elevation Effects

Kingery, Aaron	Texas A&M University
Song, Dezhen	Texas A&M University

17:25-17:45 SuBM1.6

Autonomous Vision-Based Navigation and Control for Intra-Row Weeding

Aviles Mejia, Jorge Eduardo	XLIM Research Institute, UMR CNRS 7252, University of Limoges
Soto Guerrero, Daniel	XLIM Research Institute, UMR CNRS 7252, University of Limoges
Stephant, Joanny	XLIM UMR CNRS 7252 University of Limoges
Labbani-Igbida, Ouiddad	University of Limoges -- ENSIL Engineering School -- XLIM Insti

SuBM2 Constitucion B

Computer Vision in Automation 1 (Regular Session)

Chair: Aragon-Camarasa, Gerardo	University of Glasgow
Co-Chair: Negrete, Marco	Faculty of Engineering, UNAM

15:45-16:05 SuBM2.1

HueCode2: An Illumination-Robust Meta-Marker Overlaying Multiple Fiducial Markers Using Optimal Color Scheme

Yokota, Yoshiki	Tohoku University
Fujikura, Daiki	TOHOKU UNIVERSITY
Okada, Yoshito	Tohoku University
Ohno, Kazunori	Tohoku University
Tadakuma, Kenjiro	Tohoku University
Tadokoro, Satoshi	Tohoku University

16:05-16:25 SuBM2.2

Multiview Object and View Sequence Recognition Using Hidden Markov Models

Nuñez, Lorena	Universidad Nacional Autónoma De México
Negrete, Marco	Faculty of Engineering, UNAM
Savage, Jesus	University of Mexico, UNAM
Contreras-Toledo, Luis Angel	Tamagawa University
Moctezuma Flores, Miguel	Universidad Nacional Autónoma De México

16:25-16:45 SuBM2.3

Synthetic-To-Real Domain Adaptation Using Contrastive Unpaired Translation

Imbusch, Benedikt T.	University of Bonn
Schwarz, Max	University Bonn
Behnke, Sven	University of Bonn

16:45-17:05 SuBM2.4

A Continuous Robot Vision Approach for Predicting Shapes and Visually Perceived Weights of Garments, pp. 592-599.

Duan, Li	University of Glasgow
Aragon-Camarasa, Gerardo	University of Glasgow

17:05-17:25 SuBM2.5

Parameterized B-Rep-Based Surface Correspondence Estimation for Category-Level 3D Object Matching Applicable to Multi-Part Items

Yano, Taiki	Hitachi, Ltd
Hagihara, Daisuke	Hitachi, Ltd
Kimura, Nobutaka	Hitachi, Ltd
Chihara, Nobuhiro	Hitachi, Ltd
Ito, Kiyoto	Research and Development Group, Hitachi, Ltd

17:25-17:45 SuBM2.6

Robust Human Identity Anonymization Using Pose Estimation

Zhang, Hengyuan	University of California, San Diego
Liao, Jing-Yan	University of California, San Diego
Paz, David	University of California, San Diego
Christensen, Henrik	University of California, San Diego

SuBM3 Constitucion C

Human Factors and Human-In-The-Loop (Regular Session)

Chair: Bebek, Ozkan	Ozyegin University
Co-Chair: Altamirano Cabrera, Miguel	Skolkovo Institute of Science and Technology (Skoltech), Moscow, Russia

15:45-16:05 SuBM3.1

Understanding a Robot's Guiding Ethical Principles Via Automatically Generated Explanations

Krarup, Benjamin	King's College London
Lindner, Felix	University of Ulm
Krivic, Senka	University of Sarajevo
Long, Derek	King's College London

16:05-16:25 SuBM3.2

Selecting Objects on Conveyor Belts Using Pointing Gestures Sensed by a Wrist-Worn Inertial Measurement Unit

Abbate, Gabriele	IDSIA - Istituto Dalle Molle Di Studi sull'Intelligenza Artifici
Giusti, Alessandro	IDSIA Lugano, SUPSI
Paolillo, Antonio	IDSIA USI-SUPSI
Gambardella, Luca	USI-SUPSI
Rizzoli, Andrea Emilio	USI-SUPSI
Guzzi, Jerome	IDSIA, USI-SUPSI

16:25-16:45 SuBM3.3

Exploring the Role of Electro-Tactile and Kinesthetic Feedback in Telemanipulation Task

Trinitatova, Daria	Skolkovo Institute of Science and Technology
Altamirano Cabrera, Miguel	Skolkovo Institute of Science and Technology (Skoltech), Moscow,
Ponomareva, Polina	Skolkovo Institute of Science and Technology
Fedoseev, Aleksey	Skolkovo Institute of Science AndTechnology
Tsetserukou, Dzmitry	Skolkovo Institute of Science and Technology

16:45-17:05 SuBM3.4

LinkGlide-S: A Wearable Multi-Contact Tactile Display Aimed at Rendering Object Softness at the Palm with Impedance Control in VR and Telemanipulation

Altamirano Cabrera, Miguel	Skolkovo Institute of Science and Technology (Skoltech), Moscow,
Tirado, Jonathan Andres	Skolkovo Institute of Sciences and Technology
Heredia, Juan	Skolkovo Institute of Science and Technology
Tsetserukou, Dzmitry	Skolkovo Institute of Science and Technology

17:05-17:25 SuBM3.5

Adaptive Shared Control with Human Intention Estimation for Human Agent Collaboration

Amirshirzad, Negin	Ozyegin University
Ugur, Emre	Bogazici University
Bebek, Ozkan	Ozyegin University

Oztop, Erhan	Osaka University / Ozyegin University

17:25-17:45 SuBM3.6

Time Pressure Based Human Workload and Productivity Compatible System for Human-Robot Collaboration

Shirakura, Naoki	The National Institute of Advanced Industrial Science and Techno
Takase, Ryuichi	National Institute of Advanced Industrial Science and Technology
Yamanobe, Natsuki	Advanced Industrial Science and Technology
Domae, Yukiyasu	The National Institute of Advanced Industrial Science and Techno
Ogata, Tetsuya	Waseda University

SuBM4 Imperio A

Motion and Path Planning and Control 1 (Regular Session)

Chair: Perrusquia, Adolfo	Cranfield University
Co-Chair: Guo, Weihong	Rutgers University

15:45-16:05 SuBM4.1

Leveraging Neural Networks to Guide Path Planning: Improving Dataset Generation and Planning Efficiency

Baldoni, Philip	United States Naval Research Laboratory
McMahon, James	The Naval Research Laboratory
Plaku, Erion	George Mason University

16:05-16:25 SuBM4.2

A Reinforcement Learning Path Planning Approach for Range-Only Underwater Target Localization with Autonomous Vehicles

Masmitja, Ivan	Institut De Ciencies Del Mar - CSIC
Martin, Mario	Universidad Politecnica De Catalunya
Katija, Kakani	Monterey Bay Aquarium Research Institute
Castro, Spartacus	Universitat Politecnica De Catalunya
Navarro, Joan	Institut De Ciencies Del Mar - CSIC

16:25-16:45 SuBM4.3

Anisotropic GPMP2: A Fast Continuous-Time Gaussian Processes Based Motion Planner for Unmanned Surface Vehicles in Environments with Ocean Currents

Meng, Jiawei	University College London
Liu, Yuanchang	University College London
Bucknall, Richard	University College London
Guo, Weihong	Rutgers University
Ji, Ze	Cardiff University

16:45-17:05 SuBM4.4

Centralized versus Distributed Nonlinear Model Predictive Control for Online Robot Fleet Trajectory Planning

Bertilsson, Filip	Chalmers University of Technology
Gordon, Martin	Chalmers University of Technology
Hansson, Johan	Chalmers University of Technology
Möller, Daniel	Chalmers University of Technology
Söderberg, Daniel	Daniel
Zhang, Ze	Chalmers University of Technology
Akesson, Knut	Chalmers University of Technology

17:05-17:25 SuBM4.5

Towards Online Socially Acceptable Robot Navigation

Silva Mendoza, Steven Alexander	Cardiff University
Paillacho, Dennys	Espol Polytechnic University
Verdezoto Dias, Nervo Xavier	Cardiff University
Hernández, Juan David	Cardiff University

17:25-17:45 SuBM4.6

Learning-Based Adaptive Sampling for Manipulator Motion Planning

Gaebert, Carl	Chemnitz University of Technology
Thomas, Ulrike	Chemnitz University of Technology

SuBM5 Imperio B

Foundations of Automation and Optimal/Robust Control (Regular Session)

Chair: Gans, Nicholas (Nick)	University Texas at Arlington
Co-Chair: Yang, Chenguang	University of the West of England

15:45-16:05 SuBM5.1

Optimal Deformation Control Framework for Elastic Linear Objects

Aghajanzadeh, Omid	Universite Clermont Auvergne, Institut Pascal
Picard, Guillaume	Universite Clermont Auvergne, Inrae
Corrales Ramon, Juan Antonio	Universidade De Santiago De Compostela
Cariou, Christophe	INRAE
Lenain, Roland	INRAE
Mezouar, Youcef	Clermont Auvergne INP - SIGMA Clermont

16:05-16:25 SuBM5.2

Optimization of a State Feedback Controller Using a PSO Algorithm

Tristán-Rodríguez, Diego	CINVESTAV-IPN
Garrido, Rubén	CINVESTAV, D.F
Mezura-Montes, Efren	University of Veracruz

16:25-16:45 SuBM5.3

Simultaneous Parameter Estimation and Tracking Control without Persistence of Excitation with Application in Ink-Jet Deposition

Hosseini Jafari, Bashir	Universit of Texas Atdallas
Davoodi, Mohammadreza	University of Texas at Arlington
Gans, Nicholas (Nick)	University Texas at Arlington

16:45-17:05 SuBM5.4

A Game Benchmark for Real-Time Human-Swarm Control

Meyer, Joel	Northwestern University
Pinosky, Allison	Northwestern University
Trzpit, Thomas	Northwestern University
Colgate, Edward	Northwestern University
Murphey, Todd	Northwestern University

17:05-17:25	SuBM5.5
Safe Online Gain Optimization for Cartesian Space Variable Impedance Control	
Wang, Changhao	University of California, Berkeley
Zhang, Xiang	University of California, Berkeley
Kuang, Zhian	UC Berkeley
Tomizuka, Masayoshi	University of California
17:25-17:45	SuBM5.6
A Novel Robot Skill Learning Framework Based on Bilateral Teleoperation	
Si, Weiyong	University of the West of England
Yue, Tianqi	University of Bristol
Guan, Yuan	Bristol Robotics Laboratory
Wang, Ning	University of the West of England
Yang, Chenguang	University of the West of England

SuBM6	Imperio C
Semiconductor Manufacturing and Production Scheduling (Regular Session)	
Chair: Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology
Co-Chair: Chen, Gang	Victoria University of Wellington
15:45-16:05	SuBM6.1
A Branch and Price Approach Based on Assignment Problem Modeling for Cluster Tool Scheduling	
Lee, Hyeong Yun	KAIST
Lee, Tae-Eog	KAIST
Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology
16:05-16:25	SuBM6.2
Spatio-Temporal Anomaly Detection for Substrate Strip Bin Map in Semiconductor Assembly Process	
Shen, Po-Cheng	National Cheng Kung University
Lu, Meng-Xiu	National Cheng Kung University
Lee, Chia-Yen	National Taiwan University
16:25-16:45	SuBM6.3
The Graph Neural Network–Based Dynamic Routing Algorithm for Overhead Hoist Transport Vehicles in Semiconductor Fabrication Plants	
Lee, Jaeho	Korea Advanced Institute of Science and Technology
Jang, Young Jae	Korea Advanced Institute of Science and Technology
16:45-17:05	SuBM6.4
A Dynamic Programming-Based Heuristic Algorithm for a Flexible Job Shop Scheduling Problem of a Matrix System in Automotive Industry	
Minsoo, Kim	Korea Advanced Institute of Science and Technology
Jang, Young Jae	Korea Advanced Institute of Science and Technology
17:05-17:25	SuBM6.5
Multi-Agent Reinforcement Learning for Real-Time Dynamic Production Scheduling in a Robot Assembly Cell	
Johnson, Dazzle	Department of Mechanical and Mechatronics Engineering, the Unive
Chen, Gang	Victoria University of Wellington
Lu, Yuqian	The University of Auckland

SuBM7	Colonia
Healthcare Management and Automation (Regular Session)	
Chair: Chou, Chun-An	Northeastern University
Co-Chair: Zhong, Xiang	University of Florida
15:45-16:05	SuBM7.1
Modeling of Critically Ill Patient Pathways to Support Intensive Care Delivery	
Trevena, William	University of Florida
Lal, Amos	Mayo Clinic
Zec, Simon	Mayo Clinic
Cubro, Edin	Mayo Clinic
Zhong, Xiang	University of Florida
Dong, Yue	Mayo Clinic
Gajic, Ognjen	Mayo Clinic
16:05-16:25	SuBM7.2
Impacts of Proton Accelerator Upgrade on System Level Performance of Proton Therapy Systems	
Wang, Feifan	Mayo Clinic
Huang, Yu-Li	Mayo Clinic
16:25-16:45	SuBM7.3
Dynamic Scheduling of Multi-Appointments for Hip and Knee Replacement	
Bakali El Kassimi, Ahmed	Group Aésio Santé, the Center for Health and Engineering CIS, Ec
Xie, Xiaolan	Ecole Des Mines De Saint Etienne
Sarazin, Marianne	Umrs 1136 Inserm Cis Ecole Des Mines Saint Etienne
16:45-17:05	SuBM7.4
Ensemble Generative Adversarial Imputation Network with Selective Multi-Generator (ESM-GAIN) for Missing Data Imputation	
Li, Yuxuan	Oklahoma State University
Dogan, Ayse	University of Illinois at Urbana-Champaign
Liu, Chenang	Oklahoma State University
17:05-17:25	SuBM7.5
An Enhanced Imputation Approach for Spatio-Temporal Clinical Data	
Yin, Yilin	Northeastern University
Chou, Chun-An	Northeastern University
17:25-17:45	SuBM7.6
An Efficient Simulation Budget Allocation for Pairwise Comparison	
Xiao, Hui	Southwestern University of Finance and Economics
Zhang, Yao	Southwestern University of Finance and Economics
Zhang, Si	Shanghai University

SuP2L	Ballroom Laska
Plenary II (Chengdu) (Plenary Session)	
Chair: Zhao, Qianchuan	Tsinghua University
19:00-20:00	SuP2L.1
Zero-Carbon Intelligent Energy Systems and Energy Revolution.	
Guan, Xiaohong	Xi'an Jiaotong University

SuP3L	Ballroom Laska
Plenary III (Chengdu) (Plenary Session)	
Chair: Li, Jingshan	Tsinghua University

20:00-21:00 SuP3L.1

Data Analytics and Optimization for Smart Industry.

Tang, Lixin — Northeastern University

SuCC1	Aries 1 & 2
Automation at Micro-Nano Scales 2 (Chengdu) (Regular Session)	
Chair: Qiao, Fei	Tsinghua University
Co-Chair: Yang, Liangjing	Zhejiang University

21:15-21:35 SuCC1.1

Keypoint Localization Based on Convolutional Neural Network for Robotic Implantation of Flexible Micro-Electrodes

Liang, Wenliang — Institute of Automation, Chinese Academy of Sciences
Qin, Fangbo — Institute of Automation, Chinese Academy of Sciences
Han, Xinyong — Institute of Automation Chinese Academy of Sciences
Zhang, Dapeng — Institute of Automation, Chinese Academy of Sciences

21:35-21:55 SuCC1.2

Self-Recalibrating Micromanipulator System for Resilient Robotic Vision-Based Control.

Wang, Tiexin — Zhejiang University
Li, Haoyu — Zhejiang University
Pu, Tanhong — Zhejiang University
Ding, Jingjing — Zhejiang University
Du, Shoukang — Zhejiang University
Chau, Zhong Hoo — Singapore University of Technology and Design
Tan, U-Xuan — Singapore University of Techonlogy and Design
Chew, Ting Gang — Zhejiang University-University of Edinburgh (ZJU-UoE) Institute
Yang, Liangjing — Zhejiang University

21:55-22:15 SuCC1.3

Learning Collision-Freed Trajectory of Welding Manipulator Based on Safe Reinforcement Learning

Xu, Yintao — Guangdong University of Technology
Wang, Tao — Guangdong University of Technology
Chen, Chong — Guangdong University of Technology
Hu, Bo — Guangdong University of Technology

22:15-22:35 SuCC1.4

On the Way from Lightweight to Powerful Intelligence: A Heterogeneous Multi-Robot Social System with IoT Devices

Zhang, Qian — Tsinghua University
Quan, Ruiyang — Chongqing University of Posts and Telecommunications
Qimuge, Siqin — Beijing Jiaotong University
Wei, Rui — Chongqing University
Zan, Xin — Xi'an Jiaotong University
Wang, Fangshi — Beijing Jiaotong University
Chen, Changchuan — Chongqing University of Posts and Telecommunications
Wei, Qi — Tsinghua University
Liu, Xin-Jun — Tsinghua University
Qiao, Fei — Tsinghua University

22:35-22:55 SuCC1.5

Quasi-Static Walking for Biped Robots with a Sinusoidal Gait

Wu, Shuangfei — Tsinghua Shenzhen International Graduate School, Tsinghua Univer
Wang, Changliang — Shanghai Academy of Spaceflight Technology
Ye, Linqi — Tsinghua University Graduate School at Shenzhen
Wang, Xueqian — Tsinghua University
Liu, Houde — Shenzhen Graduate School, Tsinghua University
Liang, Bin — Tsinghua University

22:55-23:15 SuCC1.6

An SEM-Based Nanomanipulation System for Multiphysical Characterization of Single InGaN/GaN Nanowires

Qu, Juntian — Tsinghua University
Wang, Renjie — McGill University
Pan, Peng — McGill University
Du, Linghao — University of Toronto
Mi, Zetian — University of Michigan
Sun, Yu — University of Toronto
Liu, Xinyu — University of Toronto

SuCC2	Aries 3
Automation for Manufacturing and Logistics 2 (Chengdu) (Regular Session)	
Chair: Li, Xinyu	Huazhong University of Science and Technology
Co-Chair: Wang, Junkai	Tongji University

21:15-21:35 SuCC2.1

A Logit Adjusting Transformer for Class Imbalance in Surface Defect Recognition

Li, Zhaofu — Huazhong University of Science and Technology
Gao, Liang — Huazhong Univ. of Sci. & Tech
Li, Xinyu — Huazhong University of Science and Technology

21:35-21:55 SuCC2.2

Position Encoding Enhanced Feature Mapping for Image Anomaly Detection

Wan, Qian — Huazhong University of Science and Technology
Cao, Yunkang — Huazhong University of Science and Technology
Gao, Liang — Huazhong Univ. of Sci. & Tech
Shen, Weiming — Huazhong University of Science and Technology
Li, Xinyu — Huazhong University of Science and Technology

21:55-22:15 SuCC2.3

Semi-Supervised Bolt Anomaly Detection in Haphazard Environment

Liu, Chuangwei — Tongji University
Yan, Yi — Tongji University

Ma, Nachuan	Tongji University
Peng, Yun	Tongji University
Liu, Chengju	Tongji University
Chen, Qijun	Tongji University

22:15-22:35 SuCC2.4

An Enhanced EWMA for Alert Reduction and Situation Awareness in Industrial Control Networks

Jiang, Baoxiang	Xi'an Jiaotong University
Liu, Yang	Xi'an Jiaotong University
Liu, Huixiang	Xi'an Jiaotong University
Ren, Zehua	Xi'an Jiaotong University
Wang, Yun	Xi'an JiaoTong University
Bao, YuanYi	Xi 'an Jiaotong University
Wang, Wenqing	Xi'an Thermal Power Research Institute Co., LTD

22:35-22:55 SuCC2.5

Flexible 3D Object Appearance Observation Based on Pose Regression and Active Motion

Wang, Shaohu	Institute of Automation, Chinese Academy of Sciences
Qin, Fangbo	Institute of Automation, Chinese Academy of Sciences
Shen, Fei	Institute of Automation, Chinese Academy of Sciences
Zhang, Zhengtao	Institute of Automation, Chinese Academy of Sciences

22:55-23:15 SuCC2.6

Novel Multi-Criteria Sustainable Evaluation for Production Scheduling Based on Fuzzy Analytic Network Process and Cumulative Prospect Theory-Enhanced VIKOR

Zhang, Peng	Tongji University
Qiao, Fei	Tongji University
Wang, Junkai	Tongji University

SuCC3 Taurus

Foundations of Automation 2 (Chengdu) (Regular Session)

Chair: Li, Lefei	Tsinghua University
Co-Chair: Li, Xiangfei	Huazhong University of Science and Technology

21:15-21:35 SuCC3.1

A Lagrangian Relaxation Heuristic Approach for Coordinated Global Intermodal Transportation

Guo, Wenjing	Wuhan University of Technology
Negenborn, R.R.	Delft University of Technology
Atasoy, Bilge	Delft University of Technology

21:35-21:55 SuCC3.2

Design, Control and Experiments of an Agile Omnidirectional Mobile Robot with Active Suspension

Jiang, Shixing	Southern University of Science and Technology
Li, Zhuolun	Southern University of Science and Technology
Lin, Shiyuan	Southern University of Science and Technology
Shi, Wujie	Southern University of Science and Technology
Zhu, Zheng	Southern University of Science and Technology
Che, Haichuan	Southern University of Science and Technology
Yin, Siyuan	Southern University of Science and Technology
Zhang, Chi	Southern University of Science and Technology
Jia, Zhenzhong	Southern University of Science and Technology

21:55-22:15 SuCC3.3

UDE-Based Robust Control of Robot Manipulator Using Dual Quaternion

Huang, Zhiheng	West China Hospital of Sichuan University / University of Electr
Lu, Qi	Sichuan University-Pittsburgh Institute
Li, Xiangyun	West China Hospital, Sichuan University
Li, Kang	Rutgers University

22:15-22:35 SuCC3.4

An Intention-Aware Deep Reinforcement Learning Method for Top-K Recommendation

Ni, Shiying	Tsinghua University
Li, Lefei	Tsinghua University

22:35-22:55 SuCC3.5

A New Error Model Based on Adjustable Exponential Basis for Image-Based Visual Servoing

Li, Xiangfei	Huazhong University of Science and Technology
Zhao, Huan	Huazhong University of Science and Technology
Liu, Dong	Huazhong University of Science and Technology
Yin, Yecan	Huazhong University of Science and Technology
Ding, Han	Huazhong University of Science and Technology

22:55-23:15 SuCC3.6

Optimal Model of Cloud-Based Multi-Agent System for Trade-Off between Trustworthiness of Data and Cost of Data Usage

Hou, Chen	China Agricultural University
Zhou, Cangqi	Nanjing University of Science and Technology
Wu, Chu-ge	Beijing Institute of Technology
Cong, Rui	Beijing Information Science and Technology University
Li, Kun	Hebei University of Technology

Technical Program for Monday August 22, 2022

Salon Fiestas

MoP1L

Plenary IV (Plenary Session)

Chair: Yi, Jingang	Rutgers University

08:00-09:00 MoP1L.1

Evolvable Field-Level Automation Architectures to Leverage AI for Physical Manufacturing and Logistics Systems.

Vogel-Heuser, Birgit	Technical University Munich

MoIP11	Imperio A
Industrial Panel 1 (Plenary Session)	
Chair: Ramirez, Antonio	Cinvestav
09:10-10:10	MoIP11.1
Panel Discussion on Artificial Intelligence in the Mexican Industry.	
Ramirez, Antonio	Cinvestav

MoAw1H	Salon Fiestas
Best Healthcare Automation Paper Award Session (Special Session)	
Chair: Li, Jingshan	Tsinghua University
09:10-10:10	MoAw1H.1
A Physiological Status Diagnosis Method Using Tensor-Based Regularization	
An, Yu	Peking University
Chen, Shanen	Peking University
Zhang, Xi	College of Engineering, Peking University
09:10-10:10	MoAw1H.2
Prediction of Diabetic Retinopathy Using Longitudinal Electronic Health Records	
Chen, Suhao	Oklahoma State University
Wang, Zekai	Oklahoma State University
Yao, Bing	Oklahoma State University
Liu, Tieming	Oklahoma State University
09:10-10:10	MoAw1H.3
Generating Counterfactual Explanations for Causal Inference in Breast Cancer Treatment Response	
Zhou, Siqiong	Arizona State University
Pfeiffer, Nicholaus	Mayo Clinic Arizona
Islam, Upala	Arizona State University
Banerjee, Imon	Mayo Clinic Arizona
Patel, Bhavika	Mayo Clinic Arizona
Iquebal, Ashif	Arizona State University

MoIP22	Imperio A
Industrial Panel 2 (Plenary Session)	
Chair: Burnstein, Jeff	Association for Advancing Automation
10:10-11:10	MoIP22.1
Trends in Industrial Automation.	
Burnstein, Jeff	Association for Advancing Automation

MoAw2S	Salon Fiestas
Best Student Paper Award Session (Special Session)	
Chair: Dotoli, Mariagrazia	Politecnico Di Bari
10:10-10:30	MoAw2S.1
Towards Object Agnostic and Robust 4-DoF Table-Top Grasping	
Raj, Prem	IIT KANPUR
Kumar, Ashish	Indian Institute of Technology, Kanpur
Sanap, Vipul	TCS
Sandhan, Tushar	Indian Institute of Technology Kanpur
Behera, Laxmidhar	IIT Kanpur
10:30-10:50	MoAw2S.2
Robust Physics Guided Data-Driven Fleet Battery Pack Fault Detection under Dynamic Operating Conditions	
Peng, Xiaomeng	Northeastern University
Jin, Xiaoning	Northeastern University
Shiming, Duan	General Motors
Sankavaram, Chaitanya	General Motors
10:50-11:10	MoAw2S.3
A4T: Hierarchical Affordance Detection for Transparent Objects Depth Reconstruction and Manipulation	
Jiang, Jiaqi	King's College London
Cao, Guanqun	University of Liverpool
Do, Thanh-Toan	Monash University
Luo, Shan	King's College London
11:10-11:30	MoAw2S.4
3D Pose Identification of Moving Micro and Nanowires in Fluid Suspensions under Bright-Field Microscopy	
Song, Jiaxu	Binghamton University
Wu, Juan	Binghamton University
Yu, Kaiyan	Binghamton University
11:30-11:50	MoAw2S.5
Optimal Shelf Arrangement to Minimize Robot Retrieval Time	
Chen, Lawrence Yunliang	UC Berkeley
Huang, Huang	University of California at Berkeley
Danielczuk, Michael	UC Berkeley
Ichnowski, Jeffrey	UC Berkeley
Goldberg, Ken	UC Berkeley

MoAM1	Constitucion A
Motion and Robot Control 1 (Regular Session)	
Chair: Dotoli, Mariagrazia	Politecnico Di Bari
Co-Chair: Hajieghrary, Hadi	Chalmers University of Technology
13:30-13:50	MoAM1.1
Dual Constraint-Based Controllers for Wheeled Mobile Manipulators	
Caliskan, Umut	Flanders Make
Ulloa Rios, Federico	KU Leuven
Decré, Wilm	Katholieke Universiteit Leuven
Aertbelien, Erwin	KU Leuven
13:50-14:10	MoAM1.2
Bayesian Optimization Based Nonlinear Adaptive PID Design for Robust Control of the Joints at Mobile Manipulators	
Hajieghrary, Hadi	Chalmers University of Technology
Deisenroth, Marc Peter	University College London
Bekiroglu, Yasemin	Chalmers University of Technology
14:10-14:30	MoAM1.3
Observer-Free Output Feedback Tracking Control for Collaborative Robotics, pp. 978-983.	
Alqatamin, Moath	University of Louisville
Taghavi, Nazita	Louisville Automation and Robotics Research Institute, Universit

Das, Sumit Kumar	University of Louisville
Popa, Dan	University of Louisville

14:30-14:50 MoAM1.4

Active Disturbance Rejection Control of a Strongly Nonlinear and Disturbed Piezoelectric Actuator Devoted to Robotic Hand

Khadraoui, Sofiane	University of Sharjah
Rakotondrabe, Micky	Laboratoire Génie De Production (LGP)
Flores, Gerardo	Center for Research in Optics

14:50-15:10 MoAM1.5

An Adaptive Model Predictive Control Approach for Position Tracking and Force Control of a Hydraulic Actuator

Bozza, Augusto	Polytechnic of Bari
Askari, Bahman	Politecnico Di Bari
Cavone, Graziana	University of Roma Tre
Carli, Raffaele	Politecnico Di Bari
Dotoli, Mariagrazia	Politecnico Di Bari

15:10-15:30 MoAM1.6

A Detection Strategy for Setpoint Attacks against Differential-Drive Robots

Cersullo, Mattia	University of Calabria
Tiriolo, Cristian	Concordia University
Franzè, Giuseppe	University of Calabria
Lucia, Walter	Concordia University

MoAM2 Constitucion B

Cyber-Physical Production Systems and Industry 4.0 2 (Regular Session)

Chair: Chang, Qing	University of Virginia
Co-Chair: Zhou, MengChu	New Jersey Institute of Technology

13:30-13:50 MoAM2.1

A Dynamic Cascading Failure Model in Power Grid with Renewable Energy Generation

Yang, Yujie	Xi'an Jiaotong University
Zhou, Yadong	Xi'an Jiaotong University
Wu, Jiang	Xian Jiaotong University
Liu, Ting	Xi'an Jiaotong University
Xu, Zhanbo	Xi'an Jiaotong University
Guan, Xiaohong	Xi'an Jiaotong University

13:50-14:10 MoAM2.2

Robust Constraints-Based Supply-Demand Coordination with Storage Systems of Enterprise Microgrid

Liu, Kun	Xi'an Jiaotong University
Gao, Feng	Xi'an Jiaotong University
Xu, Zhanbo	Xi'an Jiaotong University
Wu, Jiang	Xian Jiaotong University
Dai, Shihao	Xi'an Jiaotong University
Guan, Xiaohong	Xi'an Jiaotong University

14:10-14:30 MoAM2.3

Cost-Minimized User Association and Partial Offloading for Dependent Tasks in Hybrid Cloud-Edge Systems

Yuan, Haitao	Beihang University
Hu, Qinglong	Beihang University
Meijia, Wang	Beihang University
Bi, Jing	Beijing University of Technology, Beijing 100124, China
Zhou, MengChu	New Jersey Institute of Technology

14:30-14:50 MoAM2.4

A Voltage Deviation Threat Via Distributed Load Perturbation in Distribution Network

Huang, Hao	Department of Cyber Security, Guangdong Power Dispatching and Co
Yang, Chenyang	Xi'an Jiaotong University
Tang, Yi	Department of Cyber Security, Guangdong Power Dispatching and Co
Wu, Qinqin	Department of Cyber Security, Guangdong Power Dispatching and Co
Mei, Famao	Department of Cyber Security, Guangdong Power Dispatching and Co
Gu, Zhenwei	Department of Cyber Security, Guangdong Power Dispatching and Co
Zhou, Yadong	Xi'an Jiaotong University

14:50-15:10 MoAM2.5

Energy Saving Control in Multistage Production Systems Using a State-Based Method

Li, Yang	Northwestern Polytechnical University
Cui, Peng-Hao	Northwestern Polytechnical University
Wang, Jun-Qiang	Northwestern Polytechnical University
Chang, Qing	University of Virginia

15:10-15:30 MoAM2.6

A Bi-Level Optimization Method for Integrated Production Scheduling between Continuous Casting and Hot Rolling Processes

Tang, Wei	Chongqing University
Cao, Lingling	Chongqing University
Wen, Yao min	Chongqing University
Jiang, Sheng-long	Chongqing University

MoAM3 Constitucion C

Deep Learning in Robotics and Automation 1 (Regular Session)

Chair: Ding, Yu	Texas A&M University
Co-Chair: Sabas, Juan Francisco	CINVESTAV

13:30-13:50 MoAM3.1

GUM: A Guided Undersampling Method to Preprocess Imbalanced Datasets for Classification

Sung, Kisuk	Samsung Life Insurance
Brown, W. Eric	Texas Tech University
Moreno-Centeno, Erick	Texas A&M University
Ding, Yu	Texas A&M University

13:50-14:10 MoAM3.2

Object Goal Navigation Using Data Regularized Q-Learning

Nandiraju, Gireesh	IIIT Hyderabad
Dharmala, Amarthya Sasi Kiran	International Institute of Information Technology, Hyderabad

Banerjee, Snehasis	Tata Consultancy Services
Sridharan, Mohan	University of Birmingham
Bhowmick, Brojeshwar	Tata Consultancy Services
Krishna, Madhava	IIIT Hyderabad

14:10-14:30 MoAM3.3

MultiROS: ROS Based Robot Simulation Environment for Concurrent Deep Reinforcement Learning

Kapukotuwa, Jayasekara	Technological University of the Shannon: Midlands Midwest
Lee, Brian	Technological University of the Shannon
Devine, Declan	Technological University of the Shannon: Midlands Midwest
Qiao, Yuansong	Technological University of the Shannon: Midlands Midwest

14:30-14:50 MoAM3.4

FRobs_RL: A Flexible Robotics Reinforcement Learning Library

Fajardo, Jose Manuel	National University of Colombia
Gonzalez, Felipe	Universidad Nacional De Colombia
Realpe, Sebastian	Universidad Nacional De Colombia
Hernández, Juan David	Cardiff University
Ji, Ze	Cardiff University
Cardenas, Pedro	UNIVERSIDAD Nacional De Colombia

14:50-15:10 MoAM3.5

Multimodal Motion Prediction Based on Adaptive and Swarm Sampling Loss Functions for Reactive Mobile Robots

Zhang, Ze	Chalmers University of Technology
Dean, Emmanuel	Chalmers University of Technology
Karayiannidis, Yiannis	Lund University
Akesson, Knut	Chalmers University of Technology

15:10-15:30 MoAM3.6

Learning Switching Criteria for Sim2Real Transfer of Robotic Fabric Manipulation Policies

Sharma, Satvik	University of California, Berkeley
Novoseller, Ellen	University of California, Berkeley
Viswanath, Vainavi	University of California, Berkeley
Javed, Zaynah	University of California, Berkeley
Parikh, Rishi	University of California Berkeley
Hoque, Ryan	University of California, Berkeley
Brown, Daniel	University of Utah
Balakrishna, Ashwin	University of California, Berkeley
Goldberg, Ken	UC Berkeley

MoAM4 Imperio A

Computer Vision for Manufacturing and Transportation 2 (Regular Session)

Chair: Hashemi, Ehsan — University of Alberta

13:30-13:50 MoAM4.1

Augmented Visual Localization Using a Monocular Camera for Autonomous Mobile Robots

Salimzadeh, Ali	University of Alberta
Bhatt, Neel P.	University of Waterloo
Hashemi, Ehsan	University of Alberta

13:50-14:10 MoAM4.2

Efficient WiFi LiDAR SLAM for Autonomous Robots in Large Environments

Ismail, Khairuldanial	Singapore University of Technology and Design
Liu, Ran	Southwest University of Science and Technology
Qin, Zhenghong	Southwest University of Science and Technology
Athukorala, Achala	Zone 24x7 Pvt Ltd
Lau, Billy Pik Lik	Singapore University of Technology and Design
Bin Othman, Muhammad Shalihan	Singapore University of Technology and Design
Yuen, Chau	Singapore University of Technology and Design
Tan, U-Xuan	Singapore University of Techonlogy and Design

14:10-14:30 MoAM4.3

Dynamical Scene Representation and Control with Keypoint-Conditioned Neural Radiance Field

Wang, Weiyao	The Johns Hopkins University
Morgan, Andrew	Yale University
Dollar, Aaron	Yale University
Hager, Gregory	Johns Hopkins University

14:30-14:50 MoAM4.4

Extremal Point Tracking on Smooth Surfaces

Madsen, Steffen	The University of Southern Denmark
Jami, Milad	Novo Nordisk A/S
Petersen, Henrik Gordon	University of Southern Denmark

14:50-15:10 MoAM4.5

Penetration State Identification from Stereo Image Pair of Weld Pool in GMAW Process by Deep Learning

Liang, Zhimin	Hebei University of Science and Technology
Gao, Xu	Hebei University of Science & Technology
Zhang, Kun	Hebei University of Science & Technology
Wang, Dianlong	Hebei University of Science and Technology
Wang, Liwei	Hebei University of Science and Technology

15:10-15:30 MoAM4.6

Directed Data Association for Single Object Tracking in Point Clouds

Zhang, Yongchang	Institute of Automation, Chinese Academy of Sciences, Beijing, C
Guo, Yue	Chinese Academy of Sciences
Niu, Hanbing	University of Electronic Science and Technology of China
He, Wenhao	University of Chinese Academy of Sciences

MoAM5 Imperio B

Planning, Scheduling and Coordination 2 (Regular Session)

Chair: Carpin, Stefano	University of California, Merced
Co-Chair: Mehta, Ishaan	Toronto Metropolitan University

13:30-13:50 MoAM5.1

Deadlock Avoidance Algorithm for AGVs on a Tessellated Layout

Fransen, Karlijn	Eindhoven University of Technology
Reniers, Michel	Eindhoven University of Technology
van Eekelen, Joost	Eindhoven University of Technology

13:50-14:10 MoAM5.2

Solving Stochastic Orienteering Problems with Chance Constraints Using Monte Carlo Tree Search

Thayer, Thomas C.	University of California, Merced
Carpin, Stefano	University of California, Merced

14:10-14:30 MoAM5.3

An Innovative Formulation Tightening Approach for Job-Shop Scheduling

Yan, Bing	Rochester Institute of Technology
Bragin, Mikhail	University of Connecticut
Luh, Peter	University of Connecticut

14:30-14:50 MoAM5.4

Rendezvous Scheduling for Charging Coordination between Aerial Robot - Mobile Ground Robot

Eker, Ahmet Harun	Bogazici University
Öncü, Ahmet	Bogazici University
Bozma, H. Isil	Bogazici University

14:50-15:10 MoAM5.5

Pareto Frontier Approximation Network (PA-Net) to Solve Bi-Objective TSP

Mehta, Ishaan	Toronto Metropolitan University
Taghipour, Sharareh	Toronto Metropolitan University
Saeedi, Sajad	Toronto Metropolitan University

15:10-15:30 MoAM5.6

On Controlling Battery Degradation in Vehicle-To-Grid Energy Markets

Scarabaggio, Paolo	Politecnico Di Bari
Carli, Raffaele	Politecnico Di Bari
Parisio, Alessandra	The University of Manchester
Dotoli, Mariagrazia	Politecnico Di Bari

MoAM6 Imperio C

Agricultural Automation 2 (Regular Session)

Chair: Karydis, Konstantinos	University of California, Riverside
Co-Chair: Begovich, Ofelia	CINVESTAV - Gdl

13:30-13:50 MoAM6.1

Towards Infield Navigation: Leveraging Simulated Data for Crop Row Detection

de Silva, Rajitha	University of Lincoln
Cielniak, Grzegorz	University of Lincoln
Gao, Junfeng	University of Lincoln

13:50-14:10 MoAM6.2

Introducing Multispectral-Depth (MS-D): Sensor Fusion for Close Range Multispectral Imaging

Vuletic, Jelena	University of Zagreb, Faculty of Electrical Engineering and Comp
Polic, Marsela	University of Zagreb
Orsag, Matko	University of Zagreb, Faculty of Electrical Engineering and Comp

14:10-14:30 MoAM6.3

Distributed Mission Planning of Complex Tasks for Heterogeneous Multi-Robot Systems

Arbanas Ferreira, Barbara	University of Zagreb, Faculty of Electrical Engineering and Comp
Petrovic, Tamara	Univ. of Zagreb
Bogdan, Stjepan	University of Zagreb

14:30-14:50 MoAM6.4

Automatic Lighting Control and IoT Monitoring on an Indoor-Greenhouse

Contreras, Cuauhtemoc	Cinvestav Guadalajara
Begovich, Ofelia	CINVESTAV - Gdl

14:50-15:10 MoAM6.5

Development and Testing of a Smart Bin Toward Automated Rearing of Black Soldier Fly Larvae

Urrutia Avila, Kevin	University of California, Riverside
Campbell, Merrick	University of California, Riverside
Mauck, Kerry	University of California, Riverside
Gebiola, Marco	University of California, Riverside
Karydis, Konstantinos	University of California, Riverside

15:10-15:30 MoAM6.6

Wearable Inertial Sensor-Based Limb Lameness Detection and Pose Estimation for Horses

Yigit, Tarik	Rutgers University
Han, Feng	Rutgers University
Rankins, Ellen	Rutgers University
Yi, Jingang	Rutgers University
McKeever, Kenneth	Rutgers University
Malinowski, Karyn	Rutgers University

MoAM7 Colonia

Automation in Construction and Production (Regular Session)

Chair: Ferrarini, Luca	Politecnico Di Milano
Co-Chair: Yi, Jingang	Rutgers University

13:30-13:50 MoAM7.1

Automated Hammering Inspection System with Multi-Copter Type Mobile Robot for Concrete Structures

Nishimura, Yuki	University of Tsukuba
Takahashi, Shuki	University of Tsukuba, Intelligent and Mechanical Interaction Sy
Mochiyama, Hiromi	University of Tsukuba
Yamaguchi, Tomoyuki	University of Tsukuba

13:50-14:10 MoAM7.2

Digital Twin-Based Collision Avoidance System for Autonomous Excavator with Automatic 3D LiDAR Sensor Calibration

Satoh, Mineto	NEC Corporation

14:10-14:30 MoAM7.3

Neural Network Predictive Schemes for Building Temperature Control: A Comparative Study

Ferrarini, Luca	Politecnico Di Milano
Rastegarpour, Soroush	Politecnico Di Milano

14:30-14:50	MoAM7.4
Smartphone-Based Real-Time Indoor Positioning Using BLE Beacons	
Riesebos, Robert	University of Groningen
Degeler, Viktoriya	University of Groningen
Tello, Andrés	Bernoulli Institute for Mathematics, Computer Science, and Artif
14:50-15:10	MoAM7.5
Analysis of Process Data for Remote Health Prediction in Distributed Automation Systems	
Hsieh, Yu-Ming	National Cheng Kung University, Institute of Manufacturing Infor
Wilch, Jan	Technical University of Munich
Lin, Chin-Yi	National Cheng Kung University
Vogel-Heuser, Birgit	Technical University Munich
Cheng, Fan-Tien	National Cheng Kung University
15:10-15:30	MoAM7.6
Energy-Efficient Control in a Two-Stage Production Line with Parallel Machines	
Loffredo, Alberto	Politecnico Di Milano
Frigerio, Nicla	Politecnico Di Milano
Lanzarone, Ettore	National Research Council of Italy
Matta, Andrea	Politecnico Di Milano

MoBM1	Constitucion A
Industrial Robots (Regular Session)	
Chair: D'Avella, Salvatore	Scuola Superiore Sant'Anna
Co-Chair: Liu, Yugang	Royal Military College of Canada
15:45-16:05	MoBM1.1
A Laser Intensity Based Autonomous Docking Approach with Application to Mobile Robot Recharging in Unstructured Environments	
Liu, Yugang	Royal Military College of Canada
16:05-16:25	MoBM1.2
Handling-Design Method by Multi-Primitive Recognition of Object Shape	
Watanabe, Kosuke	University of Tsukuba
Sato, Shunsuke	University of Tsukuba
Aiyama, Yasumichi	University of Tsukuba
16:25-16:45	MoBM1.3
Towards Autonomous Soft Grasping of Deformable Objects Using Flexible Thin-Film Electro-Adhesive Gripper	
D'Avella, Salvatore	Scuola Superiore Sant'Anna
Fontana, Marco	Scuola Superiore Sant'Anna
Vertechy, Rocco	University of Bologna
Tripicchio, Paolo	Scuola Superiore Sant'Anna
16:45-17:05	MoBM1.4
Robust Position Regulation of a Seesaw Actuated by a Humanoid	
Santos Miguel, Orozco Soto	Consorzio CREATE
Ibarra Zannatha, Juan Manuel	CINVESTAV
Kheddar, Abderrahmane	CNRS-AIST
17:05-17:25	MoBM1.5
Instrument Remote Centre of Motion Estimation for Robot-Assisted Vitreoretinal Surgery	
Birch, Jeremy	King's College London
Nousias, Sotirios	NTUA
Da Cruz, Lyndon	Moorfields Eye Hospital
Rhode, Kawal	King's College London
Bergeles, Christos	King's College London
17:25-17:45	MoBM1.6
A Digital Twin Framework for Telesurgery in the Presence of Varying Network Quality of Service, pp. 1286-1293.	
Bonne, Sophea	UC Berkeley
Panitch, William	University of California, Berkeley
Dharmarajan, Karthik	UC Berkeley
Srinivas, Kishore	UC Berkeley
Kincade, Jerri-Lynn	UC Berkeley
Low, Thomas	SRI International
Knoth, Bruce	SRI International
Cowan, Cregg	SRI International
Fer, Danyal	University of California, San Francisco East Bay
Thananjeyan, Brijen	UC Berkeley
Kerr, Justin	University of California, Berkeley
Ichnowski, Jeffrey	UC Berkeley
Goldberg, Ken	UC Berkeley

MoBM2	Constitucion B
Computer Vision in Automation 2 (Regular Session)	
Chair: Yu, Kaiyan	Binghamton University
Co-Chair: Sabas, Juan Francisco	CINVESTAV
15:45-16:05	MoBM2.1
Ellipsoid SLAM with Novel Object Initialization, pp. 1294-1299.	
Meng, Yongqi	Karlsruhe Institute of Technology, KIT, Germany
Zhou, Benchun	Karlsruhe Institute of Technology, KIT, Germany
16:05-16:25	MoBM2.2
Flow Synthesis Based Visual Servoing Frameworks for Monocular Obstacle Avoidance Amidst High-Rises	
Sankhla, Harshit Kumar	International Institute of Information Technology (IIIT), Hydera
Qureshi, Mohammad Nomaan	International Institute of Information Technology (IIIT), Hydera
Vaidyanathan, Shankara Narayanan	International Institute of Information Technology (IIIT), Hydera
Mittal, Vedansh	International Institute of Information Technology (IIIT), Hydera
Gupta, Gunjan	International Institute of Information Technology (IIIT), Hydera
Pandya, Harit	Cambridge Research Laboratory, Toshiba Europe, Cambridge, UK
Krishna, Madhava	IIIT Hyderabad
16:25-16:45	MoBM2.3
Object-Based Loop Closure with Directional Histogram Descriptor, pp. 1307-1312.	
Zhou, Benchun	Karlsruhe Institute of Technology, KIT, Germany
Meng, Yongqi	Karlsruhe Institute of Technology,

	KIT, Germany

16:45-17:05 MoBM2.4

Deep Learning Based Sustainable Material Attribution for Apparels, pp. 1313-1318.

Nicherala, Yaswanth Kumar	ITC Infotech
Sadula, Srikrishna	ITC Infotech
Venkataraman, Prasanna Shrinivas	ITC Infotech

17:05-17:25 MoBM2.5

Detection of Camera Model Inconsistency and the Existence of Optical Image Stabilization System

Yeh, Shu-Hao	Texas A&M University
Wang, Di	Texas A&M University
Yan, Wei	Texas A&M University
Song, Dezhen	Texas A&M University

17:25-17:45 MoBM2.6

Rotated Bounding Box Detector without Annotation of Object Orientation by Rotating Images

Sakai, Ryo	Hitachi, Ltd
Yano, Taiki	Hitachi, Ltd
Kimura, Nobutaka	Hitachi, Ltd
Ito, Kiyoto	Research and Development Group, Hitachi, Ltd

MoBM3 Constitucion C

Deep Learning in Robotics and Automation 2 (Regular Session)

Chair: Higa, Ryota	NEC Corporation, National Institute of Advanced Industrial Science and Technology
Co-Chair: Wang, Haiyan	Hitachi America, Ltd

15:45-16:05 MoBM3.1

NLOS Ranging Mitigation with Neural Network Model for UWB Localization

Bin Othman, Muhammad Shalihan	Singapore University of Technology and Design
Liu, Ran	Southwest University of Science and Technology
Yuen, Chau	Singapore University of Technology and Design

16:05-16:25 MoBM3.2

Non-Parametric Stochastic Policy Gradient with Strategic Retreat for Non-Stationary Environment

Dastider, Apan	University of Central Florida
Mingjie, Lin	University of Central Florida

16:25-16:45 MoBM3.3

Deep Reinforcement Learning Toward Robust Multi-Echelon Supply Chain Inventory Optimization

El Shar, Ibrahim	University of Pittsburgh
Sun, Wenhuan	Carnegie Mellon University
Wang, Haiyan	Hitachi America, Ltd
Chetan, Gupta	Hitachi America Ltd

16:45-17:05 MoBM3.4

Spatial Relation Graph and Graph Convolutional Network for Object Goal Navigation

Dharmala, Amarthya Sasi Kiran	International Institute of Information Technology, Hyderabad
Anand, Kritika	TCS Innovation Labs
Kharyal, Chaitanya	IIIT Hyderabad
Kumar, Gulshan	International Institute of Information Technology, Hyderabad
Nandiraju, Gireesh	IIIT Hyderabad
Banerjee, Snehasis	Tata Consultancy Services
Roychoudhury, Ruddra dev	TCS Research & Innovation
Sridharan, Mohan	University of Birmingham
Bhowmick, Brojeshwar	Tata Consultancy Services
Krishna, Madhava	IIIT Hyderabad

17:05-17:25 MoBM3.5

High-Level Reward Deep Reinforcement Learning Approach for a Novel Physical-Logical Hybrid Factory Line Robot Vehicle Simulation

Higa, Ryota	NEC Corporation, National Institute of Advanced Industrial Scien
Nakadai, Shinji	NEC Corporation

17:25-17:45 MoBM3.6

Expert Initialized Reinforcement Learning with Application to Robotic Assembly, pp. 1366-1371.

Langaa, Jeppe	University of Southern Denmark
Sloth, Christoffer	University of Southern Denmark

MoBM4 Imperio A

Motion and Path Planning and Control 2 (Regular Session)

Chair: Shan, Jinjun	York University
Co-Chair: Roy, Dibyendu	Tata Consultancy Services Limited

15:45-16:05 MoBM4.1

Kinematically-Constrained Continuous-Path Polynomial Trajectories for Quadrotors

Alkomy, Hassan	York University
Shan, Jinjun	York University

16:05-16:25 MoBM4.2

Smooth Spline-Based Trajectory Planning for Semi-Rigid Multi-Robot Formations

Recker, Tobias	Leibniz University Hanover
Raatz, Annika	Leibniz Universität Hannover
Lurz, Henrik	Leibniz University Hanover

16:25-16:45 MoBM4.3

Real-Time OF-Based Trajectory Control of a UAS Rotorcraft Based on Integral Extended-State LQG

Zioud, Tariq	Université De Limoges XLIM UMR CNRS 7252
Escareno, Juan-Antonio	University of Limoges, ENSIL-ENSCI, XLIM Research Institute UMR
Labbani-Igbida, Ouiddad	University of Limoges -- ENSIL Engineering School -- XLIM Insti

16:45-17:05 MoBM4.4

Complete Decomposition-Free Coverage Path Planning

Kusnur, Tushar	Carnegie Mellon University
Likhachev, Maxim	Carnegie Mellon University

17:05-17:25 MoBM4.5

Exploration of Multiple Unknown Areas by Swarm of Robots Utilizing Virtual-Region Based Splitting and Merging Technique

Roy, Dibyendu	Tata Consultancy Services Limited
Maitra, Madhubanti	JADAVPUR UNIVERSITY

Bhattacharya, Samar	Jadavpur University

17:25-17:45 MoBM4.6

Deterministic Path Optimization in 2D

Khazaei Pool, Maryam	University of California Merced
Diaz Alvarenga, Carlos	University of California Merced
Kallmann, Marcelo	University of California Merced

MoBM5 Imperio B

Intelligent and Flexible Manufacturing 1 (Regular Session)

Chair: Nemec, Bojan	Jozef Stefan Institute
Co-Chair: Kovalenko, Ilya	Pennsylvania State University

15:45-16:05 MoBM5.1

Cooperative Product Agents to Improve Manufacturing System Flexibility: A Model-Based Decision Framework

Kovalenko, Ilya	Pennsylvania State University
Balta, Efe	University of Michigan
Tilbury, Dawn	University of Michigan
Barton, Kira	University of Michigan at Ann Arbor

16:05-16:25 MoBM5.2

An Adaptive, Repeatable and Rapid Auto-Reconfiguration Process in a Smart Manufacturing System for Small Box Assembly

Wang, Zi	University of Nottingham
Kendall, Peter	University of Nottingham
Gumma, Kevin	University of Nottingham
Turner, Alison	University of Nottingham
Ratchev, Svetan	The University of Nottingham

16:25-16:45 MoBM5.3

The AGV Battery Swapping Policy Based on Reinforcement Learning

Lee, Min Seok	Korea Advanced Institute of Science and Technology
Jang, Young Jae	Korea Advanced Institute of Science and Technology

16:45-17:05 MoBM5.4

Learning Skill-Based Industrial Robot Tasks with User Priors

Mayr, Matthias	Lund University
Hvarfner, Carl	Lund University
Chatzilygeroudis, Konstantinos	University of Patras
Nardi, Luigi	Stanford
Krueger, Volker	Lund University

17:05-17:25 MoBM5.5

A Virtual Mechanism Approach for Exploiting Functional Redundancy in Finishing Operations

Nemec, Bojan	Jozef Stefan Institute
Yasuda, Ken'ichi	Yaskawa Electric Co
Ude, Ales	Jozef Stefan Institute

17:25-17:45 MoBM5.6

UV Grid Generation on 3D Freeform Surfaces for Constrained Robotic Coverage Path Planning

McGovern, Sean	Worcester Polytechnic Institute
Xiao, Jing	Worcester Polytechnic Institute (WPI)

MoBM6 Imperio C

Machine Learning and Its Application (Regular Session)

Chair: Liu, Chenang	Oklahoma State University
Co-Chair: Si, Bing	State University of New York at Binghamton

15:45-16:05 MoBM6.1

Collaborative Discrimination-Enabled Generative Adversarial Network (CoD-GAN) for the Data Augmentation in Imbalanced Classification

Zhang, Ziyang	Oklahoma State University
Li, Yuxuan	Oklahoma State University
Liu, Chenang	Oklahoma State University

16:05-16:25 MoBM6.2

Robotic Control of the Deformation of Soft Linear Objects Using Deep Reinforcement Learning

Hani Daniel Zakaria, Mélodie	Institut Pascal - Université Clermont Auvergne
Aranda, Miguel	Universidad De Zaragoza
Lequievre, Laurent	Université Clermont Auvergne - CNRS
Lengagne, Sebastien	Institut Pascal CNRS UMR 6602 / Université Blaise Pascal / IFMA
Corrales Ramon, Juan Antonio	Universidade De Santiago De Compostela
Mezouar, Youcef	Clermont Auvergne INP - SIGMA Clermont

16:25-16:45 MoBM6.3

Restricted Relevance Vector Machine for Missing Data and Application to Virtual Metrology

Choi, Jeongsub	West Virginia University
Son, Youngdoo	Dongguk University
Jeong, Myong K.	Rutgers University

16:45-17:05 MoBM6.4

Transfer Learning-Based Independent Component Analysis

Zheng, Ziqian	University of Wisconsin-Madison
Liu, Kaibo	University of Wisconsin - Madison

17:05-17:25 MoBM6.5

An Efficient Surrogate Assisted Inference for Patient-Reported Outcome with Complex Missing Mechanisms

Park, Jaeyoung	University of Florida
Liang, Muxuan	University of Florida
Zhong, Xiang	University of Florida

17:25-17:45 MoBM6.6

Multi-Level Multi-Channel Bio-Signal Analysis for Health Telemonitoring

Alramadeen, Wesam	University of Binghamton
Rababa, Salahaldeen	Binghamton University
Costa, Carlos	IBM Research
Si, Bing	State University of New York at Binghamton

MoBM7 Colonia

Learning and Adaptive Systems (Regular Session)

Chair: Tang, Ying	Rowan University
Co-Chair: Perrusquia, Adolfo	Cranfield University

15:45-16:05 MoBM7.1

Performance Objective Extraction of Optimal Controllers: A Hippocampal Learning Approach

Perrusquia, Adolfo	Cranfield University
Guo, Weisi	Cranfield University

16:05-16:25 MoBM7.2

Improved Representations for Continual Learning of Novel Motor Health Conditions through Few-Shot Prototypical Networks

Russell, Matthew	University of Kentucky
Wang, Peng	University of Kentucky

16:25-16:45 MoBM7.3

A Reinforcement Learning Decentralized Multi-Agent Control Approach Exploiting Cognitive Cooperation on Continuous Environments

Camacho Gonzalez, Gerardo Jesus	Scuola Superiore Sant'Anna
D'Avella, Salvatore	Scuola Superiore Sant'Anna
Avizzano, Carlo Alberto	Scuola Superiore Sant'Anna
Tripicchio, Paolo	Scuola Superiore Sant'Anna

16:45-17:05 MoBM7.4

Learn Proportional Derivative Controllable Latent Space from Pixels

Wang, Weiyao	The Johns Hopkins University
Kobilarov, Marin	Johns Hopkins University
Hager, Gregory	Johns Hopkins University

17:05-17:25 MoBM7.5

FastATDC: Fast Anomalous Trajectory Detection and Classification

Ni, Tianle	Technical University of Munich
Wang, Jingwei	Tongji University
Ma, Yunlong	Tongji University
Wang, Shuang	Shanghai Police College
Liu, Min	Tongji University
Shen, Weiming	Huazhong University of Science and Technology

17:25-17:45 MoBM7.6

Modeling and Optimization of Student Learning in an Adaptive Serious Game

Hare, Ryan	Rowan University
Tang, Ying	Rowan University

MoCC1 Aries 1 & 2

Simulation and AI (Chengdu) (Special Session)

Chair: Peng, Yijie	Peking University
Co-Chair: Xia, Li	Sun Yat-Sen University
Organizer: Peng, Yijie	Peking University

19:00-19:20 MoCC1.1

Deep Reinforcement Learning-Based Dynamic Bandwidth Allocation in Weighted Fair Queues of Routers

Pan, Jinyan	Sun Yat-Sen University
Chen, Gang	Guangzhou University
Wu, Haoran	Sun Yat-Sen University
Peng, Xi	Huawei Technologies Co. Ltd
Xia, Li	Sun Yat-Sen University

19:20-19:40 MoCC1.2

Efficiency Analysis of a High-Bay Container Storage System -- BoxBay

Alexandri, Ioanna O	Northwestern Polytechnical University, School of Management
Yuan, Mengxue	Northwestern Polytechnical University, School of Management
Zhou, Chenhao	Northwestern Polytechnical University
Xue, Li	Northwestern Polytechnical University, School of Management

19:40-20:00 MoCC1.3

Noise Optimization in Artificial Neural Networks

Xiao, Li	Chinese Academy of Science
Zeliang, Zhang	Huazhong University of Science and Technology
Jiang, Jinyang	Peking University
Peng, Yijie	Peking University

20:00-20:20 MoCC1.4

Integrated Inventory Placement and Transportation Vehicle Selection Using Neural Network

Qiu, Junyan	Shanghai Jiao Tong University
Xia, Jun	Shanghai Jiao Tong University
Luo, Jun	Shanghai Jiao Tong University Antai College of Economics & Manag
Liu, Yang	Alibaba (China) Co., Ltd, Hangzhou, People's Republic of China
Liu, Yuxin	Alibaba (China) Co., Ltd, Hangzhou, People's Republic of China

20:20-20:40 MoCC1.5

A Feature Selection Algorithm Based on Genetic Algorithm and Ordinal Optimization for Regression Problems

Wang, Zhaojie	China Ship Research and Development Academy
Shen, Zhen	Institute of Automation, Chinese Academy of Sciences
Gao, Feng	Xi'an Jiaotong University
Sun, Mu	China Ship Research and Development Academy
Li, Junda	China Ship Research and Development Academy
Zhou, Qian	China Ship Research and Development Academy

20:40-21:00 MoCC1.6

Safety-Critical Components Analysis Using Knowledge Graph for CNC Machine

Duan, XuHai	Zhejiang University of Technology
Chen, Yong	Zhejiang University of Technology
Ji, Zuzhen	Zhejiang University of Technology
Pei, Zhi	Zhejiang University of Technology
Yi, Wenchao	Zhejiang University of Technology

MoCC2 Aries 3

Modeling, Control, and Scheduling of Robotized Manufacturing Systems (Chengdu) (Special Session)

Chair: Wu, Naiqi	Guangdong University of Technology
Co-Chair: Qiao, Yan	Macau University of Science and Technology
Organizer: Qiao, Yan	Macau University of Science and Technology
Organizer: Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology

19:00-19:20 MoCC2.1

Design of Petri Net Supervisors for Discrete Event Systems with Two Control Specifications

Li, Chengzong	Macau University of Science and Technology
Chen, Yufeng	Macau University of Science and

	Technology
Li, Zhiwu	Xidian University
Yin, Li	Macau University of Science and Technology

19:20-19:40 MoCC2.2

A Novel Cyclic Scheduling Approach to Time-Constrained Single-Arm-Robot Multi-Cluster Tools

Wang, Jipeng	Hubei University of Technology
Xue, Huan	Hubei University of Technology
Yang, Qibiao	Hubei University of Technology
Pan, Chunrong	Jiangxi University of Science and Technology

19:40-20:00 MoCC2.3

Efficient Approach to Scheduling of High Throughput Screening Systems: A Case Study

Wu, Naiqi	Guangdong University of Technology
Qiao, Yan	Macau University of Science and Technology
Li, Zhiwu	Xidian Univeristy

20:00-20:20 MoCC2.4

Design of Robust Optimization Petri Net Controller for Automated Manufacturing Systems with Unreliable Resources

Zhang, Ziliang	Xidian University
Liu, Gaiyun	Xidian University
Sun, Yu	Xidian University

20:20-20:40 MoCC2.5

Optimal Scheduling of Flexible Manufacturing Systems with a Timed Petri Net

Ahn, Jeongsun	KAIST
Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology

20:40-21:00 MoCC2.6

Integrated Scheduling of Machines and Transport Robots in Dynamic Job Shops with a Timed Petri Net

Kim, Duyeon	Korea Advanced Institute of Science and Technology
Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology

MoCC3 Taurus

Deep Learning in Robotics and Automation 3 (Chengdu) (Regular Session)

Chair: Peng, Tao	Zhejiang University
Co-Chair: Shen, Zhen	Institute of Automation, Chinese Academy of Sciences

19:00-19:20 MoCC3.1

Fusing Panoptic Segmentation and Geometry Information for Robust Visual SLAM in Dynamic Environments

Zhu, Hu	Southern University of Science and Technology
Yao, Chen	SUSTech
Zhu, Zheng	Southern University of Science and Technology
Liu, Zhengtao	SUSTech
Jia, Zhenzhong	Southern University of Science and Technology

19:20-19:40 MoCC3.2

Online Learning for Queues with Unknown Demand

Chen, Xinyun	Chinese University of Hong Kong, Shenzhen
Hong, Guiyu	Chinese University of Hong Kong, Shenzhen
Liu, Yunan	North Carolina State University

19:40-20:00 MoCC3.3

A Point-Based Neural Network for Real-Scenario Deformation Prediction in Additive Manufacturing

Zhao, Meihua	Institute of Automation, Chinese Academy of Sciences
Xiong, Gang	Institute of Automation, Chinese Academy of Sciences
Wang, Weixing	CASIA
Fang, Qihang	Institute of Automation, Chinese Academy of Sciences
Shen, Zhen	Institute of Automation, Chinese Academy of Sciences
Wan, Li	Beijing Ten Dimensions Technology Co.Ltd
Fenghua, Zhu	Chinese Academy of Sciences, Beijing

20:00-20:20 MoCC3.4

Anchor-Based Detection and Height Estimation Framework for Particle Defects on Cathodic Copper Plate Surface

Sun, Chen	Huazhong University of Science and Technology
Wan, Qian	Huazhong University of Science and Technology
Li, Zhaofu	Huazhong University of Science and Technology
Gao, Liang	Huazhong Univ. of Sci. & Tech
Li, Xinyu	Huazhong University of Science and Technology
Gao, Yiping	Huazhong University of Science and Technology

20:20-20:40 MoCC3.5

An Activity Management System for Office Workers Using Multimodal Data

Zhang, Xiangying	Zhejiang University
Zheng, Pai	The Hong Kong Polytechnic University
He, Qiqi	Zhejiang University
Peng, Tao	Zhejiang University
Tang, Wangchujun	University of Cambridge
Ye, Hongling	Zhejiang University
Tang, Renzhong	Zhejiang University

MoDC1 Aries 1 & 2

Smart Healthcare Services and Systems (Chengdu) (Special Session)

Chair: Song, Jie	Peking University
Co-Chair: Xie, Xiaolei	Tsinghua University
Organizer: Chen, Nan	Shanghai University
Organizer: Fei, Hongying	Shanghai University
Organizer: Ji, Ying	Shanghai University
Organizer: Song, Jie	Peking University
Organizer: Xie, Xiaolei	Tsinghua University
Organizer: Zhong, Xiang	University of Florida

21:15-21:35	MoDC1.1
Disease Representation Learning for Expanding Doctor Retrieval in Online Medical Platform	
Han, Xinming	Peking University
Song, Jie	Peking University
21:35-21:55	MoDC1.2
What Drives Patients to Choose a Physician Online? a Study Based on Tree Models and SHAP Values	
Wang, Yanzhi	Peking University
Zhao, Yue	Peking University
Song, Jie	Peking University
Liu, Hongju	Peking University
21:55-22:15	MoDC1.3
The Physician Scheduling of Fever Clinic in the Covid-19 Pandemic , pp. 1645-1645.	
Liu, Ran	Shanghai JiaoTong University
Fan, Xiaoyu	Shanghai Jiaotong University
Wu, Zerui	Shanghai Jiao Tong University
Pang, Bowen	Tsinghua University
Xie, Xiaolei	Tsinghua University
22:15-22:35	MoDC1.4
Appointment Scheduling of Multiple Operating Rooms Via Sampling Based Optimization	
Wei, Jinxiang	Tongji University
Hu, Zhaolin	Tongji University
22:35-22:55	MoDC1.5
Optimal Budget Allocation Rule for the Expected Opportunity Cost Using the Regression Metamodel	
Cao, Minhao	Southwestern University of Finance and Economics
Xiao, Hui	Southwestern University of Finance and Economics
22:55-23:15	MoDC1.6
Modeling and Analysis of Operating Room Workflow in a Tertiary a Hospital	
Zheng, Hanyi	Tsinghua University
Wang, Qing	Tsinghua University
Shen, Jiyong	Beijing Tsinghua Changgung Hospital
Kong, Yiying	Beijing Tsinghua Changgung Hospital
Li, Jingshan	Tsinghua University

MoDC2	Aries 3
Manufacturing and Service Systems in the New Era 1 (Chengdu) (Special Session)	
Chair: Pei, Zhi	Zhejiang University of Technology
Co-Chair: Wang, Junfeng	Huazhong University of Science and Technology
Organizer: Zhang, Liang	University of Connecticut
Organizer: Yan, Chao-Bo	Xi'an Jiaotong University
Organizer: Pei, Zhi	Zhejiang University of Technology
Organizer: Wang, Jun-Qiang	Northwestern Polytechnical University
Organizer: Wang, Junfeng	Huazhong University of Science and Technology
Organizer: Ju, Feng	Arizona State University
Organizer: Li, Yang	Northwestern Polytechnical University
Organizer: Jia, Zhiyang	Beijing Institute of Technology
21:15-21:35	MoDC2.1
Assembly State Detection Based on Deep Learning and Object Matching	
Zhao, Shiwen	Huazhong University of Science and Technology
Wang, Junfeng	Huazhong University of Science and Technology
Li, Wang	Huazhong University of Science and Technology
Liu, Maoding	Huazhong University of Science and Technology
21:35-21:55	MoDC2.2
Analysis and Improvement of Batch-Batch Production Systems	
Liu, Lingchen	Xi'an Jiaotong University
Yan, Chao-Bo	Xi'an Jiaotong University
21:55-22:15	MoDC2.3
Efficient and Accurate Simulation of Origin-Destination Flow in Telecommunication Systems	
Ma, Mingsheng	Xi'an Jiaotong University
Li, Shuaipeng	Xi'an Jiaotong University
Chang, Yuanlin	Xi`an Jiaotong University
Zhang, Sheng	Xi'an Jiaotong University
Li, Chenhong	Xi'an Jiaotong University
Gong, Xu	Huawei Technologies
Huiying, Xu	Huawei Technologies Co.LTD
Feng Gao, Feng	Xi'an Jiaotong University
Cao, Xiaoyu	Xi'an Jiaotong University
Yan, Chao-Bo	Xi'an Jiaotong University
22:15-22:35	MoDC2.4
A Branch and Price Based Algorithm for the Valet Charging of Electric Vehicles	
Zhang, Lei	Zhejiang University of Technology
Pei, Zhi	Zhejiang University of Technology
22:35-22:55	MoDC2.5
A Multi-Stage Algorithm for the Capacitated Vehicle Routing Problem with Two-Dimensional Loading and Time Windows	
Zhou, Shunqian	Xi'an Jiaotong University
Wei, Junhu	Xi'an Jiaotong University
Yan, Chao-Bo	Xi'an Jiaotong University
22:55-23:15	MoDC2.6
Energy and Productivity Analysis in Serial Production Lines with Setups	
Dong, Heng	Tsinghua University
Li, Jingshan	Tsinghua University

Technical Program for Tuesday August 23, 2022

TuPL	Salon Fiestas
Plenary V (Plenary Session)	
Chair: Lennartson, Bengt	Chalmers University of Technology

08:00-09:00 TuPL.1

Incorporating Causal Knowledge in Robot Learning.

Sucar, Luis Enrique — Instituto Nacional de Astrafisica, Optica y Electraonica

TuAT1 Constitucion A

Advances and New Challenges in Logistics and Transportation Systems (Special Session)

Chair: Fanti, Maria Pia — Politecnico Di Bari
Co-Chair: Sun, Ning — Nankai University
Organizer: Fanti, Maria Pia — Politecnico Di Bari
Organizer: Mangini, Agostino Marcello — Politecnico Di Bari
Organizer: Robba, Michela — University of Genoa
Organizer: Guo, Wenjing — Wuhan University of Technology
Organizer: Li, Wenfeng — Wuhan University of Technology

10:00-10:20 TuAT1.1

Robust Lane Detection and Tracking for Autonomous Driving of Rubber-Tired Gantry Cranes in a Container Yard

Feng, Yunjian — Southeast University
Li, Jun — Southeast University

10:20-10:40 TuAT1.2

Electric Vehicles Routing Including Smart-Charging Method and Energy Constraints

del Cacho Estil-les, María Asuncion — Polytechnic University of Bari
Fanti, Maria Pia — Politecnico Di Bari
Mangini, Agostino Marcello — Politecnico Di Bari
Roccotelli, Michele — Polytechnic of Bari

10:40-11:00 TuAT1.3

A Learning-Based Iterated Local Search Algorithm for Order Batching and Sequencing Problems

Zhou, Lijie — Beijing University of Chemical Technology
Lin, Chengran — Beijing University of Chemical Technology
Ma, Qian — Beijing University of Chemical Technology
Cao, Zhengcai — Beijing University of Chemical Technology

11:00-11:20 TuAT1.4

AggCrack: An Aggregated Attention Model for Robotic Crack Detection in Challenging Airport Runway Environment

Li, Haifeng — Civil Aviation University of China
Zong, Jianping — Civil Aviation University of China
Huang, Rui — Civil Aviation University of China
Gui, Zhongcheng — Shanghai Guimu Robot Co. Ltd
Song, Dezhen — Texas A&M University

11:20-11:40 TuAT1.5

Social-Aware Decision Algorithm for On-Ramp Merging Based on Level-K Gaming

Li, Daofei — Zhejiang University
Pan, Hao — Zhejiang University
Xiao, Yang — Lotus Technology Ltd
Li, Bo — Lotus Technology Ltd
Chen, Linhui — Zhejiang University
Li, Houjian — Zhejiang University
Lyu, Hao — Lotus Technology Ltd

11:40-12:00 TuAT1.6

A Nonlinear Control Approach for Aerial Transportation Systems with Improved Antiswing and Positioning Performance

Liang, Xiao — Nankai University
Lin, He — Nankai University
Zhang, Peng — Nankai University
Wu, Shizhen — Nankai University
Sun, Ning — Nankai University
Fang, Yongchun — Institute of Robotics and Automatic Information System, College

TuAT2 Constitucion B

Machine Learning-Enabled Modeling Technology and Its Applications (Special Session)

Chair: Yang, Chunsheng — National Research Council Canada
Co-Chair: Do, Van-Thach — Nanyang Technological University
Organizer: Yang, Chunsheng — National Research Council Canada

10:00-10:20 TuAT2.1

Lifetime Learning-Enabled Modelling Framework for Digital Twin

Yang, Chunsheng — National Research Council Canada
Li, Yifeng — ByteDance
Saddik, Abdulmotaleb — New York University AD and University of Ottawa
Liu, Zheng — University of British Columbia
Liao, Min — National Research Council Canada

10:20-10:40 TuAT2.2

RailTwin: A Digital Twin Framework for Railway

Ferdousi, Rahatara — University of Ottawa
Laamarti, Fedwa — University of Ottawa
Yang, Chunsheng — National Research Council Canada
El Saddik, Abdulmotaleb — University of Ottawa

10:40-11:00 TuAT2.3

A Weak Magnetic Detection Method for Surface Defects of 304 Stainless Steel

Xia, Ruiyan — Nanchang Hangkong University
Cheng, Qiangqiang — Nanchang Hangkong University
Xia, Guisuo — Nanchang Hangkong University
Cheng, Dongfang — Nanchang Hangkong University

11:00-11:20 TuAT2.4

An Efficient Robot Precision Assembly Skill Learning Framework Based on Several Demonstrations,

Ma, Yanqin — Nanjing Vocational University of Industry Technology
Xie, Yonghua — Nanjing Vocational University of Industry Technology
Zhu, Wenjun — NJTECH
Liu, Song — ShanghaiTech University

11:20-11:40 TuAT2.5

DFBVS: Deep Feature-Based Visual Servo

Adrian, Nicholas — Nanyang Technological University
Do, Van-Thach — Nanyang Technological University

Pham, Quang-Cuong	NTU Singapore

11:40-12:00 TuAT2.6

Human-Like Multimodal Perception and Purposeful Manipulation for Deformable Objects

Kaur, Upinder	Purdue University
Ma, Xin	Chinese Univerisity of HongKong
Huang, Yuanmeng	Purdue University
Voyles, Richard	Purdue University

TuAT3 Constitucion C

Adaptive and Resilient Cyber-Physical Manufacturing Networks (Special Session)

Chair: Wang, Hongwei	Zhejiang University
Co-Chair: Yang, Liangjing	Zhejiang University
Organizer: Yang, Liangjing	Zhejiang University
Organizer: Wang, Hongwei	Zhejiang University
Organizer: Driggs-Campbell, Katie	UIUC
Organizer: Ferreira, Placid	University of Illinois at Urbana-Champaign

10:00-10:20 TuAT3.1

Towards Cloud-Facilitated Remote Resource Sharing and Collaborative Workflow Design in Factory Robot Applications

Wang, Tengyue	Zhejiang University
Xiao, Songjie	Zhejiang University
Toro Santamaria, Ricardo	University of Illinois at Urbana Champaign
Ferreira, Placid	University of Illinois at Urbana-Champaign
Yang, Liangjing	Zhejiang University

10:20-10:40 TuAT3.2

Knowledge Driven Technologies for Digital Twins in Cyber-Physical Manufacturing Networks: A Review

Li, Mengxuan	Zhejiang University
Ma, Ke	ZJU-UIUC Institute
Chen, Haonan	University of Illinois at Urbana-Champaign
Zhang, Tianqing	Zhejiang University
Wang, Tengyue	Zhejiang University
Yang, Liangjing	Zhejiang University
Driggs-Campbell, Katie	UIUC
Wang, Hongwei	Zhejiang University

10:40-11:00 TuAT3.3

Universal Self-Calibrating Vision-Based Robotic Micromanipulator

Wang, Tiexin	Zhejiang University
Pu, Tanhong	Zhejiang University
Li, Haoyu	Zhejiang University
Yang, Liangjing	Zhejiang University

11:00-11:20 TuAT3.4

Computer Vision Aided Hidden Defects Detection in Additively Manufactured Parts

Hu, Tianxiang	ZJU-UIUC Institute, Zhejiang University
Bimrose, Miles	University of Illinois Urbana-Champaign
McGregor, Davis	University of Illinois Urbana-Champaign
Wang, Jiongxin	The University of Manchester
Tawfick, Sameh	University of Illinois at Urbana-Champaign
Shao, Chenhui	University of Illinois at Urbana-Champaign
King, William	University of Illinois Urbana-Champaign
Liu, Zuozhu	Zhejiang University

11:20-11:40 TuAT3.5

Digital Twin Framework for Reconfiguration Management

Caesar, Birte	Helmut-Schmidt-University, Institute of Automation Technology
Tilbury, Dawn	University of Michigan
Barton, Kira	University of Michigan at Ann Arbor
Fay, Alexander	Helmut-Schmidt-Universität Hamburg

11:40-12:00 TuAT3.6

Seamless Interaction Design with Coexistence and Cooperation Modes for Robust Human-Robot Collaboration

Huang, Zhe	University of Illinois at Urbana-Champaign
Mun, Ye-Ji	University of Illinois at Urbana-Champaign
Li, Xiang	University of Illinois Urbana-Champaign
Xie, Yiqing	University of Illinois at Urbana-Champaign
Zhong, Ninghan	University of Illinois at Urbana-Champaign
Liang, Weihang	University of Illinois at Urbana-Champaign
Geng, Junyi	Carnegie Mellon University
Chen, Tan	University of Illinois Urbana-Champaign
Driggs-Campbell, Katherine	University of Illinois at Urbana-Champaign

TuAT4 Imperio A

Advances of Machine Learning for Smart Manufacturing (Special Session)

Chair: Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology
Co-Chair: Liu, Ying	Cardiff University
Organizer: Liu, Ying	Cardiff University
Organizer: Li, Li	Tongji University
Organizer: Zheng, Yu	Shanghai Jiao Tong University
Organizer: Lin, Kuo-Yi	Tongji University
Organizer: Guo, Xin	Sichuan University
Organizer: Lu, Yuqian	The University of Auckland
Organizer: Wu, Dazhong	University of Central Florida
Organizer: Wang, Junliang	Donghua University
Organizer: Chen, Chong	Guangdong University of Technology

10:00-10:20 TuAT4.1

Imbalanced Wafer Map Dataset Classification with Semi-Supervised Learning Method and Optimized Loss Function

Huang, Jianchuan	Tongji University
Lin, Kuo-Yi	Tongji University
Xu, Jia	Tongji University
Li, Li	Tongji University

10:20-10:40 TuAT4.2

Understanding Context of Use from Online Customer Reviews Using BERT

Tong, Yanzhang	Cardiff University
Liang, Yan	Expert IT Services
Liu, Ying	Cardiff University
Spasic, Irena	Cardiff University
Hicks, Yulia	Cardiff University, Cardiff School of Engineering

10:40-11:00 TuAT4.3

Cross-Domain Fault Diagnosis Via Meta-Learning-Based Domain Generalization

Yue, Fengyu	University of Science and Technology of China
Wang, Yong	University of Science and Technology of China

11:00-11:20 TuAT4.4

Attention-Based Representation Learning for Time Series with Principal and Residual Space Monitoring

Wang, Botao	Hong Kong University of Science and Technology
Tsung, Fugee	HKUST
Yan, Hao	Arizona State University

11:20-11:40 TuAT4.5

Evolution Mechanism Analysis and Stability Evaluation of Machining Process Based on Minimum Entropy Space State

Li, Bohao	Xi'an Jiaotong University
Zhao, Liping	Xi'an Jiaotong University
Yao, Yiyong	XJTU University
Zhi, Yinqing	Xi'an Jiaotong University

11:40-12:00 TuAT4.6

Deep Reinforcement Learning for Scheduling of Robotic Flow Shops

Lee, Jun-Ho	Chungnam National University
Kim, Hyun-Jung	Korea Advanced Institute of Science and Technology

TuAT5 Imperio B

Manufacturing and Service Systems in the New Era 2 (Special Session)

Chair: Ju, Feng	Arizona State University
Co-Chair: Zhang, Liang	University of Connecticut
Organizer: Zhang, Liang	University of Connecticut
Organizer: Yan, Chao-Bo	Xi'an Jiaotong University
Organizer: Pei, Zhi	Zhejiang University of Technology
Organizer: Wang, Jun-Qiang	Northwestern Polytechnical University
Organizer: Wang, Junfeng	Huazhong University of Science and Technology
Organizer: Ju, Feng	Arizona State University
Organizer: Li, Yang	Northwestern Polytechnical University
Organizer: Jia, Zhiyang	Beijing Institute of Technology

10:00-10:20 TuAT5.1

Scheduling Approach for the Assembly of an Airplane with Multiple Modes, Generalized Temporal Constraints, and a Break Calendar

Bierbuesse, Jan	FernUniversitaet in Hagen
Moench, Lars	University of Hagen

10:20-10:40 TuAT5.2

A Novel Approach to Modeling of Production System: A Case Study at a Small/medium-Sized Manufacturer

Sun, Yuting	University of Connecticut
Zhang, Liang	University of Connecticut

10:40-11:00 TuAT5.3

Detection and Correction of Buffer Occupancy Data Error in Two-Machine Bernoulli Serial Lines

Zhu, Tianyu	University of Connecticut
Zhang, Liang	University of Connecticut

11:00-11:20 TuAT5.4

Simulation-Based Real-Time Production Control with Different Classes of Residence Time Constraints

Wang, Feifan	Mayo Clinic
Ju, Feng	Arizona State University

11:20-11:40 TuAT5.5

Motion Planning for Human-Robot Collaboration Based on Reinforcement Learning

Yu, Tian	University of Virginia
Chang, Qing	University of Virginia

11:40-12:00 TuAT5.6

An Adaptive Method for Flexible Configurations of Single-Arm Cluster Tools: Modeling and Scheduling

Xiong, Wenqing	Macau University of Science and Technology
Qiao, Yan	Macau University of Science and Technology
Bai, Liping	Guangdong University of Technology
Huang, Baoying	Macau University of Science and Technology
Wu, Naiqi	Guangdong University of Technology
Zhang, Siwei	Macau University of Science and Technology

TuAT6 Imperio C

Manufacturing Data Science (Special Session)

Chair: Lee, Chia-Yen	National Taiwan University
Co-Chair: Choi, Jeongsub	West Virginia University
Organizer: Lee, Chia-Yen	National Taiwan University
Organizer: Hsu, Chia-Yu	National Taipei University of Technology
Organizer: Lin, Kuo-Ping	Tunghai University

10:00-10:20 TuAT6.1

Metaheuristic and Reinforcement Learning for Scheduling Optimization in the Petrochemical Industry

Lee, Chia-Yen	National Taiwan University
Ho, Chieh-Ying	National Cheng Kung University
Hung, Yu-Hsin	National Taiwan University
Deng, Yu-Wen	National Cheng Kung University

10:20-10:40 TuAT6.2

Adaptive Sampling Strategies for Overlay Error Compensation in Semiconductor Manufacturing

Hsu, Chia-Yu	National Taipei University of

	Technology
Yao, Ying-Chu	National Taipei University of Technology

10:40-11:00 TuAT6.3

The Price of Nickel Prediction Using Hybrid Deep Learning Model in Steel Manufacturers

Lin, Kuo-Ping	Tunghai University

11:00-11:20 TuAT6.4

On Job Shop Scheduling with Restricted Set-Up Time in Steel Manufacturers

Lin, Kuo-Ping	Tunghai University

11:20-11:40 TuAT6.5

Exploration on Industrial System-Aware Dataspace towards Smart Manufacturing

Wang, Yanying	Beihang University
Cheng, Ying	Beihang University
Zhu, Yuanzhe	Beihang University
Tao, Fei	Beihang University

11:40-12:00 TuAT6.6

Optimising the Supply and Demand Decisions in High-End Equipment Manufacturing Based on Stackelberg Game.

Han, Tiaojuan	Tongji University
Lu, Jianfeng	Tongji University
Zhang, Hao	Tongji University

TuAT7 Colonia

Manipulation Planning and Control (Regular Session)

Chair: Xiong, Zhenhua	Shanghai Jiao Tong University
Co-Chair: Vatsal, Vighnesh	Tata Consultancy Services

10:00-10:20 TuAT7.1

Rotational Slippage Minimization in Object Manipulation

Hu, Jiaming	UC San Diego
Christensen, Henrik Iskov	UC San Diego

10:20-10:40 TuAT7.2

Augmenting Vision-Based Grasp Plans for Soft Robotic Grippers Using Reinforcement Learning

Vatsal, Vighnesh	Tata Consultancy Services
George, Nijil	TCS Research & Innovation

10:40-11:00 TuAT7.3

Manipulation of Deformable Linear Objects in Benchmark Task Spaces

Chang, Peng	Northeastern University
Luo, Rui	Northeastern University
Zolotas, Mark	Northeastern University
Padir, Taskin	Northeastern University

11:00-11:20 TuAT7.4

Reducing Time in Active Visual Target Search with Bayesian Optimization for Robotic Manipulation

Kittaka, Tatsuya	YASKAWA Electric Corporation

11:20-11:40 TuAT7.5

Motion Planning of Multi-Robots Object Transport with Deformable Sheet

Hu, Jiawei	Shanghai Jiao Tong University
Liu, Wenhang	Shanghai Jiao Tong University
Zhang, Heng	Shanghai Jiao Tong University
Yi, Jingang	Rutgers University
Xiong, Zhenhua	Shanghai Jiao Tong University

11:40-12:00 TuAT7.6

Dynamics Modeling and Verification of Parallel Extensible Soft Robot Based on Cosserat Rod Theory

Wang, Xiaocheng	Tsinghua University
Wang, Changliang	Shanghai Academy of Spaceflight Technology
Wang, Xueqian	Center for Artificial Intelligence and Robotics, Graduate School
Meng, Deshan	Sun Yat-Sen University
Liang, Bin	Tsinghua University
Xu, Hejie	Tsinghua Shenzhen International Graduate School

TuBT1 Constitucion A

Motion and Robot Control 2 (Regular Session)

Chair: Yu, Wen	CINVESTAV-IPN
Co-Chair: Saeedi, Sajad	Toronto Metropolitan University

13:30-13:50 TuBT1.1

Adaptive Control Methodology for a Class of Nonlinear Systems with Speed Tracking Implementation for a BLDC Motor

Gil Bayardo, Raul	CINVESTAV- IPN
Loukianov, Alexander G.	CINVESTAV- IPN
Sanchez, Edgar N.	CINVESTAV- IPN

13:50-14:10 TuBT1.2

Online Modeling and Control of Soft Multi-Fingered Grippers Via Koopman Operator Theory

Shi, Lu	University of California, Riverside
Mucchiani, Caio	University of California Riverside
Karydis, Konstantinos	University of California, Riverside

14:10-14:30 TuBT1.3

Real-Time Sliding Mode Fault Diagnosis for a Three-Wheeled Omnidirectional Mobile Robot

Lizarraga, Adrian	Cinvestav
Begovich, Ofelia	CINVESTAV - Gdl
Ramirez, Antonio	Cinvestav

14:30-14:50 TuBT1.4

Posture Stabilization Control for a Quadruped Robot Walking on Swaying Platforms

Li, Jiayi	Tsinghua University
Ye, Linqi	Tsinghua University Graduate School at Shenzhen
Jin, Zongxiang	Shanghai Academy of Spaceflight Technology
Liu, Houde	Shenzhen Graduate School, Tsinghua University
Liang, Bin	Tsinghua University

14:50-15:10 TuBT1.5

Contouring Control of an Innovative Manufacturing System Based on Dual-Arm Robot

Kornmaneesang, Woraphrut	National Chung Cheng University
Chen, Shyh-Leh	National Chung Cheng Univeristy
Boonto, Sudchai	KMUTT

15:10-15:30 TuBT1.6

Deep Direct Visual Servoing of Tendon-Driven Continuum Robots

Abdulhafiz, Ibrahim	Ryerson University

Nazari, Ali A.	Toronto Metropolitan University
Abbasi-Hashemi, Taha	Ryerson Universigy
Jalali, Amir	Ryerson University
Zareinia, Kourosh	Ryerson University
Saeedi, Sajad	Toronto Metropolitan University
Janabi-Sharifi, Farrokh	Ryerson University

TuBT2 Constitucion B

Recent Advances in Theory and Applications of Simulation-Based Optimization (Special Session)

Chair: Shi, Zhongshun	University of Tennessee Knoxville
Co-Chair: Jin, Xiao	National University of Singapore
Organizer: Gao, Siyang	City University of Hong Kong
Organizer: Chen, Weiwei	Rutgers University

13:30-13:50 TuBT2.1

Convergence Rate Analysis of the Optimal Computing Budget Allocation Algorithm

Li, Yanwen	City University of Hong Kong
Gao, Siyang	City University of Hong Kong
Shi, Zhongshun	University of Tennessee Knoxville

13:50-14:10 TuBT2.2

An Efficient Bi-Fidelity Method for Continuous Simulation Optimization

Wang, Gengchen	Northeastern University
Jin, Xiao	National University of Singapore
Lee, Loo Hay	National University of Singapore

14:10-14:30 TuBT2.3

A Simulation Optimization-Aided Learning Method for Design Automation of Scheduling Rules

Ma, Hang	University of Tennessee, Knoxville
Zhang, Cheng	University of Tennessee, Knoxville
Shi, Zhongshun	University of Tennessee Knoxville

14:30-14:50 TuBT2.4

Monitoring Portfolio Risk Via Likelihood Ratio Regression

Shi, Jiangnan	Harbin Institute of Technology
Jiang, Guangxin	Harbin Institute of Technology

14:50-15:10 TuBT2.5

Comprehensive Review of Intelligent Modeling and Control of Smart Building

Diego, Peredo	CINVESTAV-IPN
Yu, Wen	CINVESTAV-IPN

TuBT3 Constitucion C

Knowledge Representation and Reasoning for Autonomous Agents (Special Session)

Chair: Jia, Yunyi	Clemson University
Co-Chair: Liu, Wenxin	Lehigh University
Organizer: Sun, Yu	University of South Florida
Organizer: Jia, Yunyi	Clemson University
Organizer: Paulius Ramos, David	Brown University

13:30-13:50 TuBT3.1

Hybrid Approach for Anticipating Human Activities in Ambient Intelligence Environments

Moulouel, Koussaila	University Paris Est Créteil -UPEC
Chibani, Abdelghani	Lissi Lab Paris EST University
Abdelkawy, Hazem	LISSI Laboratory, University of Paris-Est Creteil (UPEC)
Amirat, Yacine	University of Paris Est Créteil (UPEC)

13:50-14:10 TuBT3.2

Robot Learning of Assembly Tasks from Non-Expert Demonstrations Using Functional Object-Oriented Network

Chen, Yi	Clemson University
Paulius Ramos, David	Brown University
Sun, Yu	University of South Florida
Jia, Yunyi	Clemson University

14:10-14:30 TuBT3.3

Context-Dependent Anomaly Detection with Knowledge Graph Embedding Models

Vaska, Nathan	MIT Lincoln Laboratory
Leahy, Kevin	MIT Lincoln Laboratory
Helus, Victoria	MIT Lincoln Laboratory

14:30-14:50 TuBT3.4

Knowledge Graph-Based Approach to Trace the Full Life Cycle Information of Decommissioned Electromechanical Products

Ma, Longzhou	University of Science and Technology Beijing
Wu, Xiuli	University of Science and Technology Beijing
Kuang, Yuan	University of Science and Technology Beijing
Tang, Ying	University of Science and Technology Beijing
Xiang, Dong	University of Science and Technology Beijing

14:50-15:10 TuBT3.5

Wind Energy Forecasting Using Multiple ARIMA Models .

Li, Xiaoou	Center of Research and Advanced Studies of NationalPolytechnic I
Sabas, Juan Francisco	CINVESTAV
Duarte Méndez, Vicente Adnan	CINVESTAV

15:10-15:30 TuBT3.6

Theoretical and Experimental Studies on Microgrid Control

Liu, Wenxin	Lehigh University

TuBT4 Imperio A

Motion and Path Planning and Control 3 (Regular Session)

Chair: Prakash, Ravi	TU Delft
Co-Chair: Dutta, Ayan	University of North Florida

13:30-13:50 TuBT4.1

Threat-Aware Selection for Target Engagement

Biediger, Daniel	University of Houston
Becker, Aaron	University of Houston

13:50-14:10 TuBT4.2

Closed Form HJB Solution for Path Planning of a Robot Manipulator with Warehousing Applications

Prakash, Ravi	TU Delft
Mohanta, Jayant Kumar	Assistant Professor, IIT Jodhpur
Behera, Laxmidhar	IITK

14:10-14:30 TuBT4.3

Minimalist Coverage and Energy-Aware Tour Planning for a Mobile Robot

Ghosh, Anirban	University of North Florida
Dutta, Ayan	University of North Florida
Sotolongo, Brian	UNF

14:30-14:50 TuBT4.4

Simulation Aided Anticipatory Congestion Avoidance for Warehouses

Bhati, Hardik	IIITA
Suri, Garvit	Indian Institute of Information Technology , Allahabad
Kala, Rahul	Indian Institute of Information Technology, Allahabad, India
Nandi, Gora Chand	IIIT, Allahabad

14:50-15:10 TuBT4.5

A Multi-Objective Optimization Approach for Trajectory Planning in a Safe and Ergonomic Human-Robot Collaboration

Proia, Silvia	Politecnico Di Bari
Cavone, Graziana	University of Roma Tre
Carli, Raffaele	Politecnico Di Bari
Dotoli, Mariagrazia	Politecnico Di Bari

15:10-15:30 TuBT4.6

Safe Motion Planning for a Mobile Robot Navigating in Environments Shared with Humans

Sakcak, Basak	University of Oulu
Bascetta, Luca	Politecnico Di Milano

TuBT5 Imperio B

Planning, Scheduling and Coordination 3 (Regular Session)

Chair: Yan, Bing	Rochester Institute of Technology
Co-Chair: Zhao, Ye	Georgia Institute of Technology

13:30-13:50 TuBT5.1

Accounting for Preemption and Migration Costs in the Calculation of Hard Real-Time Cyclic Executives for MPSoCs

Rubio, Laura Elena	CINVESTAV- IPN
Briz, José Luis	Universidad De Zaragoza
Ramirez, Antonio	CINVESTAV- IPN

13:50-14:10 TuBT5.2

A New Nested Partition Algorithm for Parallel Machine Scheduling Problem with Hard Q-Times and Setup Times

Wang, Chaoran	Univ. of Wisconsin-Madison
Shi, Leyuan	Univ. of Wisconsin-Madison

14:10-14:30 TuBT5.3

Congestion-Aware Routing for Multi-Class Mobility-On-Demand Service, pp. 2035-2041.

Shrivastava, Niharika	Indian Institute of Information Technology, Allahabad
Meghjani, Malika	Singapore University of Technology and Design

14:30-14:50 TuBT5.4

A Parameterized Sequential Decision Approach to Job-Shop Scheduling

Srivastava, Amber	ETH Zurich
Basiri, Salar	University of Illinois at Urbana-Champaign
Kapadia, Mustafa	University of Illinois at Urbana-Champaign
Ferreira, Placid	University of Illinois at Urbana-Champaign
Salapaka, Srinivasa M	University of Illinois at Urbana-Champaign

14:50-15:10 TuBT5.5

A MIP-Based Approach for Multi-Robot Geometric Task-And-Motion Planning

Zhang, Hejia	University of Southern California
Chan, Shao-Hung	University of Southern California
Zhong, Jie	University of Southern California
Li, Jiaoyang	University of Southern California
Koenig, Sven	University of Southern California
Nikolaidis, Stefanos	University of Southern California

15:10-15:30 TuBT5.6

Reactive Task Allocation and Planning for Quadrupedal and Wheeled Robot Teaming

Zhou, Ziyi	Georgia Institute of Technology
Lee, Dong Jae	Georgia Institute of Technology
Yoshinaga, Yuki	Georgia Institute of Technology
Balakirsky, Stephen	Georgia Tech
Guo, Dejun	UBTECH North America R&D Center
Zhao, Ye	Georgia Institute of Technology

TuBT6 Imperio C

AI-Based Methods (Regular Session)

Chair: Yao, Bing	Oklahoma State University
Co-Chair: Ramirez, Antonio	Cinvestav

13:30-13:50 TuBT6.1

Multi-Branching Neural Network for Myocardial Infarction Prediction

Wang, Zekai	Oklahoma State University
Liu, Chenang	Oklahoma State University
Yao, Bing	Oklahoma State University

13:50-14:10 TuBT6.2

CIPCaD-Bench: Continuous Industrial Process Datasets for Benchmarking Causal Discovery Methods

Menegozzo, Giovanni	University of Verona
Dall'Alba, Diego	University of Verona
Fiorini, Paolo	University of Verona

14:10-14:30 TuBT6.3

Performance Evaluation of AI Algorithms on Heterogeneous Edge Devices for Manufacturing

Rupprecht, Bernhard	Technical University of Munich
Hujo, Dominik	Technical University of Munich
Vogel-Heuser, Birgit	Technical University Munich

14:30-14:50 TuBT6.4

Data Uncertainty Learning for Single Image Camera Calibration

Hu, Zhiqiang	KYOCERA Corporation
Arata, Koji	KYOCERA Corporation Minatomirai Research Center
Mikuni, Yoshitaka	Kyocera

14:50-15:10 TuBT6.5

Skill Transfer for Surface Finishing Tasks Based on Estimation of Key Parameters

Kim, Yitaek	University of Southern Denmark
Sloth, Christoffer	University of Southern Denmark
Kramberger, Aljaz	University of Southern Denmark

15:10-15:30 TuBT6.6

Directed Explorations During Flood Disasters Using Multi-UAV System

Garg, Armaan	Indian Institute of Technology Ropar
Jha, Shashi Shekhar	Indian Institute of Technology Ropar

TuBT7 Colonia

Manufacturing, Maintenance and Supply Chains (Regular Session)

Chair: Choi, Jeongsub	West Virginia University
Co-Chair: Yue, Xiaowei	Virginia Tech

13:30-13:50 TuBT7.1

Integrated Process-System Modeling and Performance Analysis for Serial Production Lines

Li, Chen	University of Virginia
Chang, Qing	University of Virginia
Xiao, Guoxian	General Motors Corporation
Arinez, Jorge	General Motors Research & Development Center

13:50-14:10 TuBT7.2

Dynamic Robot Assignment for Flexible Serial Production Systems

Bhatta, Kshitij	University of Virginia
Huang, Jing	University of Virginia
Chang, Qing	University of Virginia

14:10-14:30 TuBT7.3

Stress-Aware Optimal Placement of Actuators for Ultra-High Precision Quality Control of Composite Structures Assembly

AlBahar, Areej	Virginia Polytechnic Institute and State University
Kim, Inyoung	Virginia Polytechnic Institute and State University
Lutz, Tim	Virginia Polytechnic Institute and State University
Yue, Xiaowei	Virginia Tech

14:30-14:50 TuBT7.4

Suboptimal Decision Tree with Explainable Features for Machining Outcome Estimation

Hsu, Chih-Hua	Chung Yuan Christian University
Yang, Haw-Ching	National Kaohsiung Univ. of Sci. and Tech

14:50-15:10 TuBT7.5

Smart E-Waste Marketplace: Matching Experiments, pp. 2134-2137.

Sarukkai, Arya	Stopewaste.org/Redwood Middle School

15:10-15:30 TuBT7.6

Golden Path Search Algorithm for the KSA Scheme

Ing, Ching Kang	National Tsing Hua University
Lin, Chin-Yi	National Cheng Kung University
Hsieh, Yu-Ming	National Cheng Kung University, Institute of Manufacturing Infor
Peng, Po Hsiang	National Tsing Hua University
Cheng, Fan-Tien	National Cheng Kung University

TuCT1 Constitucion A

Control Architectures and Service Robotics (Regular Session)

Chair: Scherzinger, Stefan	FZI Research Center for Information Technology
Co-Chair: Adeleye, Akanimoh	University of California, San Diego

15:45-16:05 TuCT1.1

Educate Complex C Programming Artefacts for Robotics to Mechanical Engineers Freshmen – Array, Pointer, Loop

Vogel-Heuser, Birgit	Technical University Munich
Land, Kathrin Sophie	Technical University of Munich
Hujo, Dominik	Technical University of Munich
Krüger, Marius	Technical University of Munich

16:05-16:25 TuCT1.2

Towards Distributed Real-Time Capable Robotic Control Using ROS2

Plasberg, Carsten	FZI Forschungszentrum Informatik
Hendrik, Nessau	FZI Forschungszentrum Informatik
Timmermann, David	FZI Forschungszentrum Informatik
Eichmann, Christian	FZI Research Center for Information Technology
Roennau, Arne	FZI Forschungszentrum Informatik, Karlsruhe
Dillmann, Rüdiger	FZI - Forschungszentrum Informatik - Karlsruhe

16:25-16:45 TuCT1.3

Introduction of an Assistance System to Support Domain Experts in Programming Low-Code to Leverage Industry 5.0

Neumann, Eva-Maria	Technical University of Munich
Vogel-Heuser, Birgit	Technical University Munich
Haben, Fabian	Technical University of Munich
Krüger, Marius	Technical University of Munich
Wieringa, Timotheus	HAWE Hydraulik SE

16:45-17:05 TuCT1.4

Putting Away the Groceries with Precise Semantic Placements

Adeleye, Akanimoh	University of California, San Diego
Hu, Jiaming	UC San Diego
Christensen, Henrik	University of California, San Diego

17:05-17:25 TuCT1.5

Design of a Conveyor Belt Manipulator for Reposition of Boxes in Logistics Centers

Yumbla, Francisco	ESPOL Polytechnic University
Medrano Yax, Juan Fernando	Sungkyunkwan University
Valarezo Añazco, Edwin	Escuela Superior Politecnica Del Litoral
Jung, Hong-ryul	Sungkyunkwan University
Luong, Tuan	Sungkyunkwan University
Seo, Sungwon	SungkyunKwan University
Shin, Jinjae	Sungkyunkwan University
Moon, Hyungpil	Sungkyunkwan University

17:25-17:45 TuCT1.6

A Walking Space Robot for On-Orbit Satellite Servicing: The ReCoBot

Scherzinger, Stefan	FZI Research Center for Information Technology
Weinland, Jakob	FZI Research Center for Information Technology
Wilbrandt, Robert	FZI Forschungszentrum Informatik
Becker, Pascal	FZI Forschungszentrum Informatik
Roennau, Arne	FZI Forschungszentrum Informatik, Karlsruhe

Dillmann, Rüdiger	FZI - Forschungszentrum Informatik - Karlsruhe

TuCT2	Constitucion B
Collaborative Robots in Manufacturing (Regular Session)	
Chair: Lennartson, Bengt	Chalmers University of Technology
Co-Chair: Salt Ducaju, Julian Mauricio	LTH, Lund University

15:45-16:05	TuCT2.1
Replicating Human Skill for Robotic Deep-Micro-Hole Drilling	
Maric, Bruno	Univeristy of Zagreb, Faculty of Electrical Engineering and Comp
Petric, Frano	University of Zagreb, Faculty of Electrical Engineering and Comp
Stuhne, Dario	Faculty of Electrical Engineering and Computing, University of Z
Ranogajec, Vanja	OMCO Croatia D.o.o
Orsag, Matko	University of Zagreb, Faculty of Electrical Engineering and Comp

16:05-16:25	TuCT2.2
Global Safety Characteristics of Wheeled Mobile Manipulators	
Mansfeld, Nico	Technical University of Munich
Gómez Peña, Guillermo	Franka Emika GmbH
Hamad, Mazin	Technical University of Munich (TUM)
Kurdas, Alexander Andreas	Technical University of Munich
Abdolshah, Saeed	Technical University of Munich
Haddadin, Sami	Technical University of Munich

16:25-16:45	TuCT2.3
Sizing of a Fleet of Cooperative and Reconfigurable Robots for the Transport of Heterogeneous Loads	
Chaikovskaia, Mari	LIMOS, INP Clermont Auvergne
Gayon, Jean-Philippe	LIMOS, INP Clermont Auvergne
Marjollet, Mairtin	ISIMA, INP Clermont-Augergne

16:45-17:05	TuCT2.4
Robot Cartesian Compliance Variation for Safe Kinesthetic Teaching Using Safety Control Barrier Functions	
Salt Ducaju, Julian Mauricio	LTH, Lund University
Olofsson, Bjorn	Lund University
Robertsson, Anders	LTH, Lund University
Johansson, Rolf	Lund University

17:05-17:25	TuCT2.5
A Passivity-Based Adaptive Admittance Control Strategy for Physical Human-Robot Interaction in Hands-On Tasks	
Bascetta, Luca	Politecnico Di Milano

17:25-17:45	TuCT2.6
Relevant Safety Falsification by Automata Constrained Reinforcement Learning	
Cronrath, Constantin	Chalmers University of Technology
Huck, Tom Philip	Karlsruhe Institute of Technology
Ledermann, Christoph	Karlsruhe Institute of Technology
Kroeger, Torsten	Karlsruher Institut of Technology
Lennartson, Bengt	Chalmers University of Technology

TuCT3	Constitucion C
Factory Automation (Regular Session)	
Chair: Lu, Yuqian	The University of Auckland
Co-Chair: Moench, Lars	University of Hagen

15:45-16:05	TuCT3.1
An Autonomous Mobile Robot for Quality Assurance of Car Body	
Karl, Matthias	Carl Zeiss AG
Forstenhäusler, Marc	Ulm University
Nguyen-Cong, Trinh	Carl Zeiss AG
Dietmayer, Klaus	University of Ulm
Glasenapp, Carsten	Carl Zeiss AG

16:05-16:25	TuCT3.2
Programming Abstractions for Simulation and Testing on Smart Manufacturing Systems	
Hsieh, Chiao	University of Illinois at Urbana-Champaign
Wu, Daniel	University of Illinois at Urbana-Champaign
Koh, Yubin	University of Illinois at Urbana-Champaign
Mitra, Sayan	University of Ilinois, Urbana Champagne

16:25-16:45	TuCT3.3
Decentralizing Decision-Making for Product Transition Management in Semiconductor Manufacturing	
Carlos A Leca Perez, Carlos Leca	North Carolina State University
Karl Kempf, Karl Kempf	Intel
Uzsoy, Reha	North Carolina State University

16:45-17:05	TuCT3.4
Learning Dispatching Rules for a Single-Machine Energy-Aware Batch Scheduling Problem	
Schorn, Daniel	University of Hagen
Moench, Lars	University of Hagen

17:05-17:25	TuCT3.5
Trajectory Tracking Kinematic Control of Omnidirectional Mobile Robots Via Active Disturbance Rejection Control with Anti-Peaking Mechanism	
Ramirez-Neria, Mario	Universidad Iberoamericana
Luviano-Juarez, Alberto	UPIITA - IPN México
Madonski, Rafal	Jinan University
Hernandez-Martinez, Eduardo Gamaliel	Universidad Iberoamericana Ciudad De México
Fernandez-Anaya, Guillermo	Universidad Iberoamericana
Lozada-Castillo, Norma	Sepi Upiita Ipn

17:25-17:45	TuCT3.6
Deep Learning Based Litter Identification and Adaptive Cleaning Using Self-Reconfigurable Pavement Sweeping Robot	
Felix, Braulio	SUTD
Lim, Yi	Singapore University of Technology and Design
Ramalingam, Balakrishnan	Singapore University of Technology and Design
Rayguru, Madan Mohan	Delhi Technological University
Hayat, Abdullah Aamir	Singapore University of Technology and Design
Pathmakumar, Thejus	Singapore University of Technology and Design
Leong, Kristor Leong Jie Kai	Singapore University of

	Technology and Design
Elara, Mohan Rajesh	Singapore University of Technology and Design

TuCT4 Imperio A

Motion and Path Planning and Control 4 (Regular Session)

Chair: Selvaggio, Mario	Università Degli Studi Di Napoli Federico II
Co-Chair: Yi, Jingang	Rutgers University

15:45-16:05 TuCT4.1

Bio-Inspired Obstacle Avoidance Using Wavelet-Based Element Analysis

Ahmad, Shakeeb	University of Colorado - Boulder
Turin, Zoe	University of Colorado Boulder
Humbert, James Sean	University of Colorado Boulder

16:05-16:25 TuCT4.2

E³MoP: Efficient Motion Planning Based on Heuristic-Guided Motion Primitives Pruning and Path Optimization with Sparse-Banded Structure

Wen, Jian	Nankai University
Zhang, Xuebo	Nankai University,
Gao, Haiming	Zhejiang Lab
Yuan, Jing	College of Computer and Control Engineering, Nankai University
Fang, Yongchun	Institute of Robotics and Automatic Information System, College

16:25-16:45 TuCT4.3

Dual-Arm Object Transportation Via Model Predictive Control and External Disturbance Estimation

Lei, Maolin	Humanoids and Human Centered Mechatronics (HHCM) Research Line O
Selvaggio, Mario	Università Degli Studi Di Napoli Federico II
Wang, Ting	Robotics Lab., Shenyang Institute of Automation, CAS
Ruggiero, Fabio	Università Di Napoli Federico II
Zhou, Cheng	Tencent
Yao, Chen	Shenyang Institute of Automation, Chinese Academy of Sciences
Zheng, Yu	Tencent

16:45-17:05 TuCT4.4

Constrained Time-Optimal Adaptive Robust Control of Linear Motors Using an Indirect Method

Liu, Yingqiang	State Key Laboratory of Fluid Power and Mechatronic Systems, Zhe
Chen, Zheng	Zhejiang University
Yao, Bin	Zhejiang University

17:05-17:25 TuCT4.5

Motion Control of an Autonomous Wheel-Leg Bikebot

Huang, Xinyan	Zhejiang University
Han, Feng	Rutgers University
Han, Yi	Kochi University of Technology
Wang, Shuoyu	Kochi University of Technology
Liu, Tao	Zhejiang University
Yi, Jingang	Rutgers University

17:25-17:45 TuCT4.6

Leveraging Distributional Bias for Reactive Collision Avoidance under Uncertainty: A Kernel Embedding Approach

Gupta, Anish	International Institute of Information Technology, Hyderabad
Singh, Arun Kumar	University of Tartu
Krishna, Madhava	IIIT Hyderabad

TuCT5 Imperio B

Intelligent and Flexible Manufacturing 2 (Regular Session)

Chair: Fraccaroli, Enrico	University of North Carolina at Chapel Hill
Co-Chair: Li, Xiaoou	CINVESTAV-IPN

15:45-16:05 TuCT5.1

Capability-Based Frameworks for Industrial Robot Skills: A Survey

Pantano, Matteo	Siemens AG
Eiband, Thomas	German Aerospace Center (DLR)
Lee, Dongheui	Technische Universität Wien (TU Wien)

16:05-16:25 TuCT5.2

A Flexible Collision-Free Trajectory Planning for Multiple Robot Arms by Combining Q-Learning and RRT

Kawabe, Tomoya	Okayama University
Nishi, Tatsushi	Okayama University

16:25-16:45 TuCT5.3

Acoustic Based GMAW Penetration Depth Identification Using Droplet Transfer Monitoring

Cullen, Mitchell	University of Technology Sydney
Ji, Jinchen	University of Technology Sydney
Zhao, Sipei	Centre for Audio, Acoustics and Vibration, Faculty of Engineerin

16:45-17:05 TuCT5.4

Process Dynamics-Aware Flexible Manufacturing for Industry 4.0

Balszun, Michael	Technial University of Munich
Hobbs, Clara	Department of Computer Science, UNC-Chapel Hill
Fraccaroli, Enrico	University of North Carolina at Chapel Hill
Roy, Debayan	Technical University of Munich
Fummi, Franco	University of Verona
Chakraborty, Samarjit	TU Munich, Germany

17:05-17:25 TuCT5.5

Convolutional Autoencoder and Transfer Learning for Automatic Virtual Metrology

Hsieh, Yu-Ming	National Cheng Kung University, Institute of Manufacturing Infor
Wang, Tan-Ju	National Cheng Kung University
Lin, Chin-Yi	National Cheng Kung University
Tsai, Yueh-Feng	National Cheng Kung University
Cheng, Fan-Tien	National Cheng Kung University

17:25-17:45 TuCT5.6

Semantically Connected Funded Projects (SCFP) with DrOWLings

Ehm, Hans	Infineon Technologies AG
Ramzy, Nour	Leibniz Universität Hannover ,

	Infineon Technologies AG
Ulrich, Philipp	Infineon
Durst, Sandra	Infineon
Masip, Agnes	Infineon

TuCT6 Imperio C

Wearable Robots and Soft Manipulation (Regular Session)

Chair: Wen, John	Rensselaer Polytechnic Institute
Co-Chair: Haghshenas-Jaryani, Mahdi	New Mexico State University

15:45-16:05 TuCT6.1

Wearable Sensing and Knee Exoskeleton Control for Awkward Gaits Assistance

Zhu, Chunchu	Rutgers University
Han, Feng	Rutgers University
Yi, Jingang	Rutgers University

16:05-16:25 TuCT6.2

Learning-Based Error-Constrained Motion Control for Pneumatic Artificial Muscle-Actuated Exoskeleton Robots with Hardware Experiments

Yang, Tong	Nankai University
Chen, Yiheng	Nankai University
Sun, Ning	Nankai University
Liu, Lianqing	Shenyang Institute of Automation
Qin, Yanding	Nankai University
Fang, Yongchun	Institute of Robotics and Automatic Information System, College

16:25-16:45 TuCT6.3

Adaptive Quasi-Static Motion Control of a Soft Robotic Exo-Digit in Physical Human-Wearable-Soft-Robot-Interaction

Haghshenas-Jaryani, Mahdi	New Mexico State University

16:45-17:05 TuCT6.4

Robotic Fabric Fusing Using a Novel Electroadhesion Gripper

He, Honglu	Rensselaer Polytechnic Institute
Saunders, Glenn	Rensselaer Polytechnic Institute
Wen, John	Rensselaer Polytechnic Institute

17:05-17:25 TuCT6.5

Force Sensing Based on Nail Deformation for Measurement of Fingertip Force in Detailed Work

Yamazaki, Kimitoshi	Shinshu University
Nakagawa, Yuto	Shinshu University
Ishikawa, Akihisa	Shinshu University
Hirayama, Motoki	JUKI Corporation

TuCT7 Colonia

Automation in Life Sciences and Human-In-The-Loop (Regular Session)

Chair: Chen, Yue	Georgia Institute of Technology
Co-Chair: Wang, Jiacun	Monmouth University

15:45-16:05 TuCT7.1

Automatic Triage and Image Mosaicking in the Ophthalmology Specialisation

Hu, Roger	University of Auckland
Chalakkal, Renoh Johnson	Senior Research Engineer
Linde, Glenn	ODocs Eye Care
Dhupia, Jaspreet	The University of Auckland

16:05-16:25 TuCT7.2

Automated Sample Pretreatment and Measurement of Benzodiazepines in Serum Using a Biomek I7 Hybrid Workstation and LC-MS/MS

Fleischer, Heidi	University of Rostock
Bach, Anna	University of Rostock
Anne, Reichelt	University of Rostock
Wijayawardena, Bhagya	Beckman Coulter Life Sciences
Kheradmand, Miranda	Beckman Coulter Life Sciences
Thurow, Kerstin	University Rostock

16:25-16:45 TuCT7.3

Supervised Adaptive Fuzzy Control of LVAD with Pulsatility Ratio Modulation

Azizkhani, Milad	Georgia Institute of Technology
Chen, Yue	Georgia Institute of Technology

16:45-17:05 TuCT7.4

Identify Bottlenecks of Patient Flow in Emergency Departments

Hu, Yuansi	Monmouth University
Wang, Jiacun	Monmouth University
Liu, Guangjun	Tongji University

17:05-17:25 TuCT7.5

To Collaborate or Not to Collaborate: Understanding Human-Robot Collaboration

Villani, Valeria	University of Modena and Reggio Emilia
Ciaramidaro, Angela	University of Modena and Reggio Emilia
Iani, Cristina	University of Modena and Reggio Emilia
Rubichi, Sandro	University of Modena and Reggio Emilia
Sabattini, Lorenzo	University of Modena and Reggio Emilia

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Automation for a Resilient Society

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IEEE International Conference on Automation Science and Engineering (CASE) is the flagship automation conference of the IEEE Robotics and Automation Society (RAS) and constitutes the primary forum for cross-industry and multidisciplinary research in automation. Its goal is to provide broad coverage and dissemination of foundational research in automation among researchers and practitioners. IEEE CASE 2023 will be held in Auckland, New Zealand, on August 27-31, 2023, and the theme is **Automation for a Resilient Society.**

Auckland is one of the world's most sustainable and liveable cities with dynamic multi-culture and inclusive communities as well as an innovative hub in the Asia Pacific region. CASE 2023 will be a unique opportunity for attendees around the world to enjoy the stunning views of the New Zealand landscape, experience the passion and diversity of this vibrant city, and learn about the automation-enabled innovation and transformation of agriculture, aquaculture, forestry, manufacturing, infrastructure, and healthcare sectors in Aotearoa New Zealand.

Submission of Special Session / Workshop Proposals and Regular Papers

IEEE CASE 2023 invites special session and workshop proposals, regular papers, industry papers and presentation-only papers related to the conference topics, which include but are not limited to:

- Human-centred automation
- Automation in life science
- Sustainability and green automation
- Automation in agriculture and horticulture
- Automation sciences for pandemics
- Healthcare automation
- Smart building and construction
- Knowledge-based automation
- Manufacturing automation
- Cloud-based automation
- Big data, data mining and machine learning
- Privacy and security in automation

Key Dates

15 February 2023: Special session proposal submission due

1 March 2023: Regular & special session full paper submission due

1 April 2023: Workshop proposal, industry paper & presentation only paper submission due

15 May 2023: Paper acceptance notification

15 June 2023: Final paper submission due

15 June 2023: Author registration due

28 August-1 September 2023: Conference

Contacts

General Chair
Professor Xun Xu
The University of Auckland
✆: +64 9 923 4527
✉: x.xu@auckland.ac.nz

Programme Chair
Prof. Dr.-Ing. Birgit Vogel-Heuser
Technical University of Munich
✆: +49 89 289 16400
✉: vogel-heuser@tum.de

Organisation Chair
Dr. Yuqian Lu
The University of Auckland
✆: +64 9 923 1584
✉: yuqian.lu@auckland.ac.nz

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