Conference Booklet

IEEE 18th International Conference on Advanced Motion Control, AMC2024

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This program is supported by a subsidy from Kyoto City and the Kyoto Convention & Visitors Bureau.

Welcome Message

On behalf of the organizing committee, it is our pleasure to welcome all delegates, representatives, and participants from all around the world to the 18th IEEE International Conference on Advanced Motion Control in Kyoto (AMC2024), which brings together researchers from both academia and industry, and to promote the-state-of-the-art motion control technologies and applications. We sincerely hope that this event will satisfy your highest expectations for an intellectually stimulating and culturally enjoyable experience.

The main sponsor of AMC2024 Kyoto is the IEEE Industrial Electronics Society (IES). The International Conference on Advanced Motion Control (AMC) is one of the greatest activities within IES. Every AMC conference we have a great number of young participants engaging in discussions of advanced motion control technology.

The first AMC was held in Yokohama-city, Japan, in 1990, and its General Chair was Prof. Kouhei Ohnishi at Keio University. After 34 years from the first AMC and following to the last conference at University of Padova, Italy in 2022, our wish is to have in Kyoto many chances to engage in enthusiastic discussions on motion-control-related issues and open research problems.

Kyoto, which is the former capital of Japan, has been chosen as the venue for the conference. The venue, Kyoto Research Park, is a few minutes away by either train or bus from Kyoto Station. It is also located near the Shijo area, a major downtown area, and Arashiyama, a popular tourist spot. Kyoto's traditional crafting and rich cultural experiences will give you a glimpse of the Heian period.

Each paper submitted to the conference has been put through a rigorous peer review planned by the respective program, special session chairs and organizers. We also appreciate all contributions and cooperation by the committee members, sponsoring societies and organizations towards the success of the conference. We extend our sincere thanks to the session organizers and the many reviewers who volunteered their time and efforts to uphold the quality of this conference.

We do hope that the conference will be highly successful and fruitful for all participants and that you will fully enjoy the workshop in both its technical and social aspects at AMC2024 Kyoto.

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Nagaoka University of Technology, Japan

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Subsidy

Kyoto City and the Kyoto Convention & Visitors Bureau

Conference Venue

Conference Dates

Feb. 28 - Mar. 1, 2024

Conference Venue

Kyoto Research Park, Kyoto, Japan

Access to the Venue

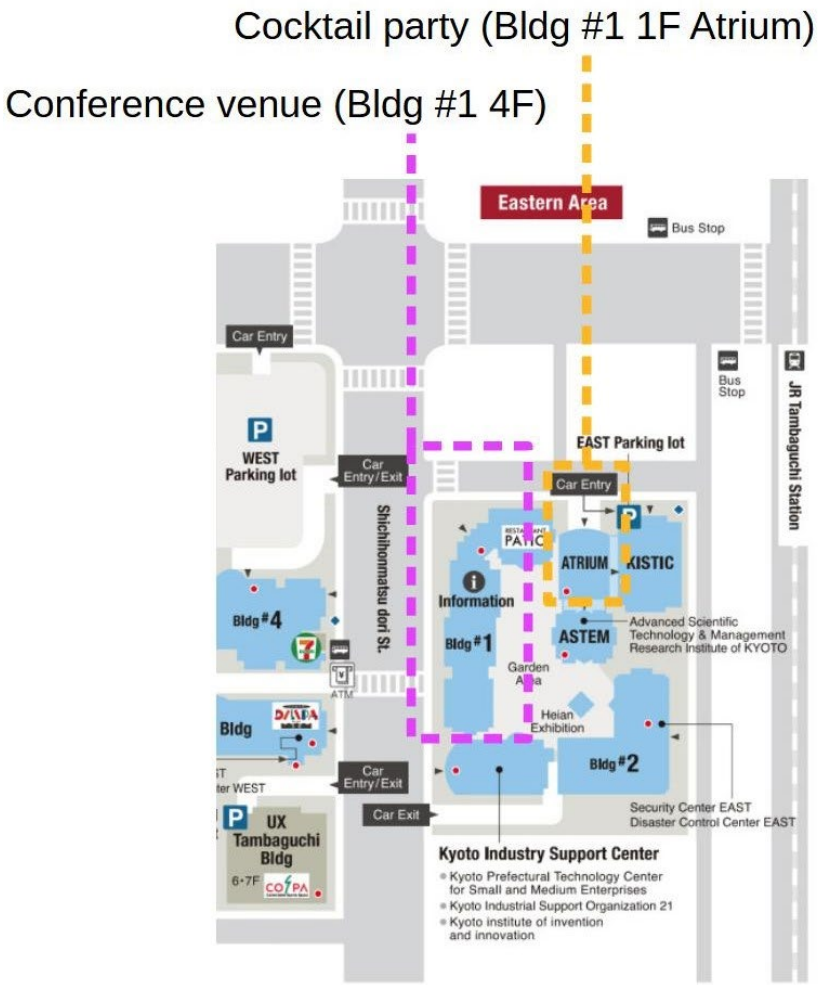
From JR Kyoto Station to KRP

Taxi: 10 minutes (Approx. 1,000 JPY)

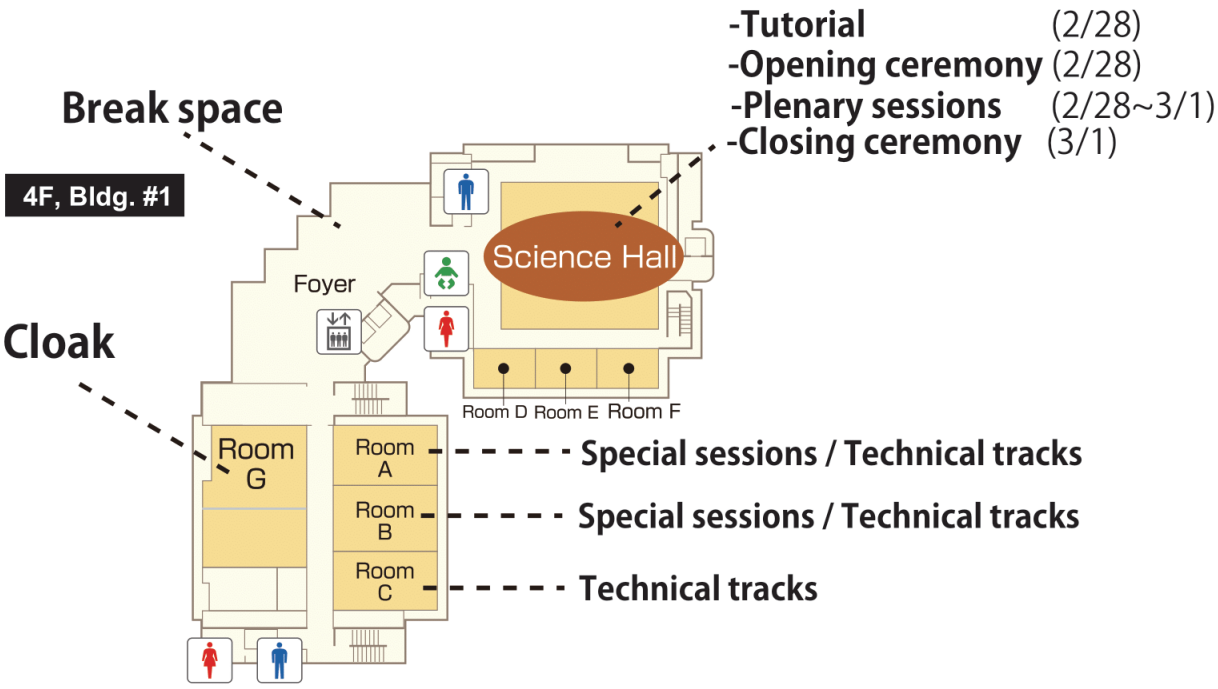
JR San-in (Sagano) line (Local)

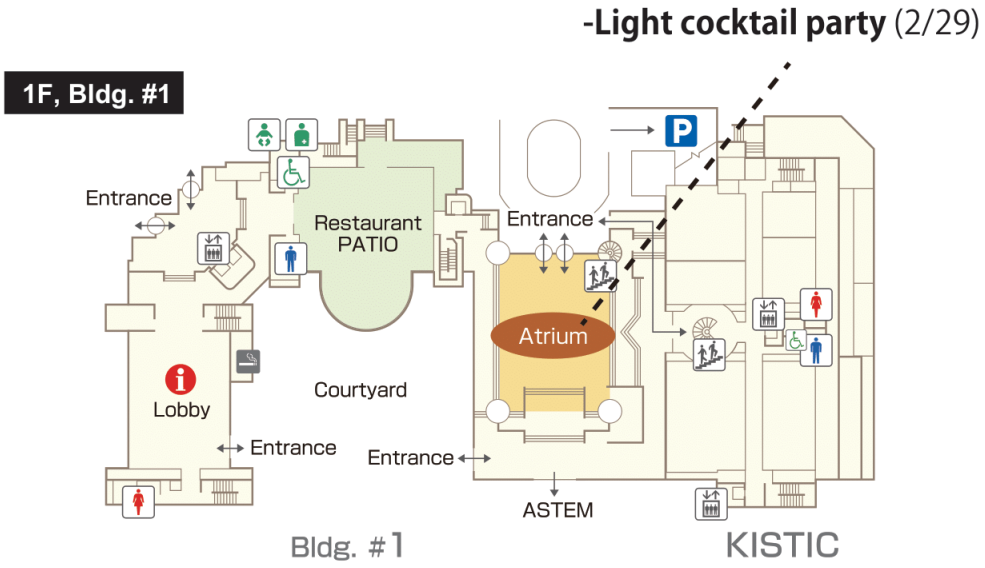
Please get off at the second stop, Tambaguchi Station (4 minutes, 140 JPY).

4 minutes to walk from the station to Kyoto Research Park.



Floor Map


-Tutorial (2/28)
-Opening ceremony (2/28)
-Plenary sessions (2/28~3/1)
-Closing ceremony (3/1)
Break space
4F, Bldg. #1
Science Hall
Foyer
Cloak
Room D
Room E
Room F
Room G
Room A
Room B
Room C
Special sessions / Technical tracks
Special sessions / Technical tracks
Technical tracks


-Light cocktail party (2/29)
1F, Bldg. #1
Entrance
Restaurant PATIO
Entrance
Atrium
Lobby
Courtyard
Entrance
Entrance
ASTEM
Bldg. #1
KISTIC

Banquet

Banquet Site and the date

19:00~, 28th February 2024 (1st day of the conference), at Kyoto Tower Hotel

Access to the banquet site

By BUS (Bound for Kyoto Station)

"Kyoto Research Park 4 Go-Kan Mae" Bus Stop
Keihan Kyoto Kotsu Bus

Departure time 17:45, 18:29

"Kyoto Research Park Mae" Bus Stop
Kyoto City Bus Route No. 75, 73
Departure time 17:31, 17:35, 17:51, 18:11,18:15
Keihan Kyoto Kotsu Bus
Departure time 17:37, 17:59, 18:22

Arrival at Kyoto station, Drop off area (marked on Red in the right figure). Down the stairs and walk to Kyoto Tower underground entrance.

By JR (Bound for Kyoto Station)

From Tanbaguchi station
Departure time 17:32, 17:45, 18:00, 18:16, 18:32

Arrival at Kyoto station, go to Central gate.
You will find the light-house like Kyoto Tower.
Walk through bus stop area and traffic.

Program Overview

	Science Hall	Room A	Room B	Room C
	February 28			
10:30-12:00	Tutorial			
	Lunch break			
13:00-13:10	Opening ceremony			
13:10-14:40	Plenary session I			
	Break			
15:00-17:20		SS : Robot Environment Interaction: 0023, 0027, 0046, 0047, 0048, 0064, 0088	TT : Actuators and sensors in motion control I: 0004, 0015, 0054, 0058, 0061, 0068	TT : Advanced motion control I: 0005, 0016, 0020, 0051, 0055, 0083
19:00	Banquet (Kyoto Tower Hotel)			

	February 29			
9:00-10:30	Plenary session II			
	Break			
10:50-12:10		SS : Novel Control Technology in Precision Motion Control for Mechatronic Systems I: 0029, 0056, 0077, 0082	SS : Intelligent Sensing and Control Applications for Human Assistive Systems: 0019, 0076, 0095, 0119	TT : Automotive and vehicular motion systems I: 0033, 0073, 0093, 0094
	Lunch break			
13:10-14:30		SS : Novel Control Technology in Precision Motion Control for Mechatronic Systems II: 0075, 0085, 0092, 0117	TT : Actuators and sensors in motion control II: 0037, 0038, 0103, 0111	TT : Automotive and vehicular motion systems II: 0018, 0025, 0040, 0043
	Break			
14:50-16:50		TT : Adaptive control and AI in motion control systems I: 0031, 0039, 0067, 0069, 0074, 0112	TT : Actuators and sensors in motion control III: 0024, 0036, 0044, 0072, 0102, 0116	TT : Advanced motion control II: 0011, 0041, 0059, 0081, 0087, 0101
17:30	Light cocktail party (Kyoto Research Park Atrium)			

	March 1			
9:00-10:30	Plenary session III			
	Break			
10:50-12:10		SS : Innovative Vehicle Motion Control: Emphasizing Smart and Energy-efficient Solutions: 0010, 0017, 0089, 0118	TT : Micro- and nano-mechatronics and high-precision motion control: 0006, 0107, 0109	TT : Advanced motion control III: 0008, 0032, 0084, 0090
	Lunch break			
13:10-15:10		TT : Adaptive control and AI in motion control systems II: 0007, 0028, 0053, 0062, 0079, 0099	TT : Force control, haptics, and HMI: 0012, 0013, 0035, 0078, 0086, 0113	TT : Advanced motion control IV: 0034, 0050, 0063, 0066, 0098, 0100
15:20-15:30	Closing ceremony			

Plenary Session I

Disturbance Observer Based Motion Control and Its Applications

Speaker	**Kiyoshi Ohishi** **Nagaoka University of Technology, Japan**
Time	13:10 - 14:40, February 28, 2024
Location	Science Hall

Abstract

Disturbance Observer has been firstly presented at the international conference IPEC-Tokyo in 1983. From 1983, Disturbance Observer has been applied in many industry applications. In AMC2024, my session would like to focus on Disturbance Observer based “robot motion control” and “force control”. At first, my talk has the anti-slip re-adhesion control system based on disturbance observer, which has been proposed for commuter train in 2001. As this system has the fine torque response for the driving wheel driven by inverter-fed induction motor, has been applied to the actual commuter train in 2004, which is Series 205-5000 of East Japan Railway Company. Second, as the robot actuator is the coupled systems of gear and servomotor, it becomes the two-inertia resonance systems. Hence, it is made into the equivalent one inertia system for fine robot motion control such as hybrid control of force and position. Finally, since the disturbance observer has an equivalent differential calculation, it must be robust against observation noise. One solution is to apply a Kalman filter or SSA. In this session, my talk has the one real example of applying Kalman filters and SSA to disturbance observers for force control.

Biography

Kiyoshi Ohishi received the B.E., M.E., and Ph.D. degrees in electrical engineering from Keio University, Yokohama, Japan, in 1981, 1983, and 1986, respectively. Since 1993, he has been with Nagaoka University of Technology, Nagaoka, Japan. He has been a full Professor from 2003 to 2023, a Vice President from 2016 to 2021 and an Executive Director from 2019 to 2021 in Nagaoka University of Technology. Now, he is a Professor Emeritus and an Academia-Industry Researcher in Nagaoka University of Technology. He is an IEEE Fellow Member from 2015, whose contributions are the Development of Fast and Robust Motion Control based on Force Sensing Technology, of which results have been used in many industrial applications. He applied the anti-slip re-adhesion control to the actual electric commuter train of the East Japan Railway Company, and he has established the world top record of data-transfer rate 250 Mb/s to the post Blue-ray optical disk system in 2009. He has obtained "Outstanding Paper Award" of IECON 1985. After this paper, he became one of the world-leaders of the technical fields of Advanced Motion Control. Moreover, he has received "Best Paper Award" at IECON2002 and IECON2004. His research interests include motion control, mechatronics, robotics and power electronics. He is an IEEE IES member for 39 years. Now, he is a Life Fellow member. From 2004, he has been an AdCom Member at large of IEEE IES Society for 12 years. Now, he is a senior AdCom Member of IEEE IES Society from 2016, and he is a voting AdCom Member for from 2004. In Japan, he is a Fellow Member of IEEJ (the Institute of Electrical Engineers of Japan) from 2015. He has been a Vice President of IEEJ and an Editor in Chief of IEEJ Journal of Industry Applications whose impact factor is 1.7.

Plenary Session II

Autonomous mobile robots and manipulators in factory automation: from Industry 4.0 toward Industry 5.0

Speaker	**Marina Indri** **Polytechnic University of Torino, Italy**
Time	9:00 - 10:30, February 29, 2024
Location	Science Hall

Abstract

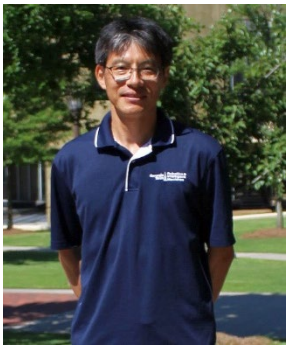
Autonomous mobile robots (AMRs), manipulators and cobots are key elements in Smart Factories that benefit from Industry 4.0 design principles, such as interoperability, decentralization, real-time capability, virtualization, service orientation, and modularity. The brand-new paradigm of Industry 5.0 envisages an increasingly important role for the human operator in the production lines of the next future, thanks to human-centric solutions based on proactive human-robot collaborations and artificial intelligence applications. A primary role is then expected for AMRs and mobile manipulators as workmates of the human operators. This talk outlines the current state of the art and investigates trends and challenges for the next future.

Biography

Marina Indri earned her Ph.D. degree from Politecnico di Torino, Italy, in 1995. She has been an Associate Professor in Robotics and Automatic Control at Politecnico di Torino since 2001. She serves as Associated Editor of the IEEE Transactions on Industrial Informatics and as Senior Editor of the IEEE/ASME Transactions on Mechatronics. She is an IEEE Senior Member and an elected Member-at-Large of the IEEE Industrial Electronics Society Administrative Committee. She is author of more than 100 papers in the industrial and mobile robotics areas. She received the Best Paper Award in Factory Automation at ETFA 2013, the 2nd prize of the euRobotics Technology Transfer Award in 2014, and was among the finalists of the same Award in 2017 for joint works with COMAU S.p.A.

Plenary Session III

Physiological Digital Twin for Connected Healthcare



Speaker	**Jun Ueda** **Georgia Institute of Technology, USA**
Time	9:00 – 10:30, March 1, 2024
Location	Science Hall

Abstract

This talk will present the development of personalized mathematical models for motor control and healthcare device research, which are designed to simulate and predict an individual's various physiological responses. In healthcare, digital twin technology - initially introduced in industrial manufacturing - has become a revolutionary approach for individualized patient modeling. Physiological digital twins are crucial for advancing tailored interventions and enabling early, personalized responses to healthcare needs. Key to the potential transformation of healthcare by these digital twins are achievements in multi-modal sensing, patient-specific modeling, and implementation including privacy preservation. Dynamic system identification methods must be carefully applied when using mechanical platforms to induce perturbations for human physiological system modeling due to physical interaction. This talk will address the challenges and opportunities in designing these perturbations and in identifying key dynamic parameters, with examples from gait analysis, neurological facilitation exercises, and magnetic resonance elastography (MRE). The crucial integration of advanced motion control with compliant robotics highlights the need for interdisciplinary collaboration in the fields of medicine and related areas.

Biography

Jun Ueda, PhD, Professor, Georgia Institute of Technology Dr. Jun Ueda is a Professor in the G. W. Woodruff School of Mechanical Engineering at the Georgia Institute of Technology. He received his B.S., M.S., and Ph.D. degrees in Mechanical Engineering from Kyoto University, Kyoto, Japan, in 1994, 1996, and 2002, respectively. From 1996 to 2000, he was a Research Engineer at the Advanced Technology Research and Development Center of Mitsubishi Electric Corporation in Japan. He served as an Assistant Professor at the Nara Institute of Science and Technology, Japan, from 2002 to 2008. From 2005 to 2008, he was also a visiting scholar and lecturer in the Department of Mechanical Engineering at the Massachusetts Institute of Technology. He joined the faculty at the Georgia Institute of Technology as an Assistant Professor in 2008 and was the Director of the Robotics Ph.D. Program at Georgia Tech from 2015 to 2017. He also served as the Chair of the Editorial Board for the IEEE International Conference on Advanced Intelligent Mechatronics (AIM) and as the General Chair for the 2023 IEEE/SICE International Symposium on System Integration (SII). Dr. Ueda is currently a Senior Editor for the IEEE/ASME Transactions on Mechatronics. He is the author of 'Cellular Actuators: Modularity and Variability in Muscle-Inspired Actuation' (Butterworth-Heinemann, 2017) and 'Human Modeling for Bio-Inspired Robotics' (Academic Press, 2017). His recognitions include the Fanuc FA Robot Foundation Best Paper Award in 2005, the IEEE Robotics and Automation Society Early Academic Career Award in 2009, the Advanced Robotics Best Paper Award in 2015, and the Nagamori Award in 2021.

Tutorial and Special Sessions

Tutorial

Kouhei Ohnishi, Keio University
10:30 - 12:00, February 28, 2024
“Contact Task by Robot”

Special Sessions

SS1: Robot Environment Interaction
Organizers:
Emre Sariyildiz, University of Wollongong
Barkan Ugurlu, Ozyegin University,
Tomoyuki Shimono, Yokohama National University
Takahiro Nozaki, Keio University,
Tarik Uzunovic, University of Sarajevo

SS2: Intelligent Sensing and Control Applications for Human Assistive Systems
Organizers:
Koichi Hidaka, Tokyo Denki University
Sota Shimizu, Shibaura Institute of Technology
Masahide Ito, Aichi Prefectural University
Junya Sato, Gifu University

SS3: Innovative Vehicle Motion Control: Emphasizing Smart and Energy-efficient Solutions
Organizers:
Barys Shyrokau, Delft University of Technology
Alessandro Correa-Victorino, Sorbonne Universités/Université de Technologie Compiègne
Valentin Ivanov, Ilmenau University of Technology

SS4: Novel Control Technology in Precision Motion Control for Mechatronic Systems
Organizers:
Shota Yabui, Tokyo City University
Masahiro Mae, The University of Tokyo
Juan Padron, Nagaoka University of Technology
Kenji Natori, Chiba University
Kazuaki Ito, Gifu University
Tom Oomen, Eindhoven University of Technology

Session Schedule

Wednesday, 28 February 2024

10:30-12:00 Science Hall
Tutorial
Speaker: Professor Kouhei Ohnishi, Keio University, Japan
Title: Contact Task by Robot
Chair: Kiyoshi Ohishi

12:00-13:00 Foyer
Lunch Break

13:00-13:10 Science Hall
Opening Ceremony
Chairs: Toshimasa Miyazaki and Yasutaka Fujimoto

13:10-14:40 Science Hall
Plenary Session I (AMC24-000120)
Speaker: Professor Kiyoshi Ohishi, Nagaoka University of Technology, Japan
Title: Disturbance Observer Based Motion Control and Its Applications
Chair: Toshimasa Miyazaki

14:40-15:00
Foyer
Coffee Break

15:00-17:00
Room A "SS: Robot Environment Interaction"
Chairs: Emre Sariyildiz, Barkan Ugurlu
15:00-15:20
AMC24-000048 Analysis and Synthesis of the Disturbance Observer-based Robust Force Control Systems in State Space
Emre Sariyildiz
15:20-15:40
AMC24-000023 Cascade Position and Force Control via Saturation and a Compensator for Switching
Minoru Yokoyama, Satoru Nakamura, Tomoyuki Shimono

15:40-16:00
AMC24-000047 A Novel Stiffness Modulation Mechanism for Energy Efficient Variable Stiffness Actuators
Emre Sariyildiz
16:00-16:20
AMC24-000046 Human-in-the-Loop Training Leads to Faster Skill Acquisition and Adaptation in Reinforcement Learning-based Robot Control
Deniz Yilmaz, Barkan Ugurlu, Erhan Oztop
16:20-16:40
AMC24-000027 Maneuverability Improvement by Feedback Compensation of a Physically Human-Interacting Robot with Variable Damping Control
Narawich Songthumjitti, Takeshi Inaba
16:40-17:00
AMC24-000064 Interaction Stability of Force Feedback Device and Admittance Adaptive For Unknown Environment
Xu Deng, Dapeng Tian, Jian Chen
17:00-17:20
AMC24-000088 Redesign of Basic Module and Mordular Robot Assembly for Educational Tool
Kaoru Mitsuhashi

Room B "TT: Actuators and Sensors in Motion Control I"
Chairs: Wen-Chung Chang, Ning Sun
15:00-15:20
AMC24-000004 Dynamic Modeling for 3-Dimensional Cooperative Dual Boom Cranes: Analysis and Verification
Zhuoqing Liu, Tong Yang, qingxiang Wu, Yinan Wu, He Chen, Ning Sun
15:20-15:40
AMC24-000015 Structural health monitoring system development for ship rudders
WonSeok Jang, Jee Hun Song, Suk Yoon Hong
15:40-16:00
AMC24-000058 Spacecraft Attitude Stabilization Control under Actuator Faults and Input Saturation
Umair Javaid, Michael Basin, Salman Ijaz
16:00-16:20
AMC24-000054 Model and Analysis of Forklift Motion for Extracting Operational Factors of Accidents
Takeo Hagiwara, Toshiyuki Murakami
16:20-16:40

AMC24-000060 Automated Recursive Hand-Eye Calibration Employing 3D Point Cloud Registration
Wen-Chung Chang, Yi-Da Chen, Hong-Da Lin
16:40-17:00
AMC24-000068 Temperature Prediction Method for Windings by Homogeneous Material
Akihiro Katsuno, Toshiyuki Murakami

Room C "TT: Advanced Motion Control I"
Chairs: Johann Reger, Damiano Padovani
15:00-15:20
AMC24-000020 State Observers for Output Feedback Control of an Electromagnetic Levitation System
Damiano Padovani, Andrea Cioncolini, Angelo Alessandri
15:20-15:40
AMC24-000051 Compensators for A Marine Vessel Keeping Tracking Errors Within the Designed Values Against White Noises
Shu Onitsuka, Yuki Nishimura
15:40-16:00
AMC24-000071 Disturbance Observer Based Safety-Critical Model Predictive Control for Overhead Cranes
Jiangtong Wang, Zheng Tian, Jun YANG, Shihua Li
16:00-16:20
AMC24-000055 Experimental Evaluation of Homogeneous Differentiators Applied to Hydraulic Stroke with Measurement Noise and Acceleration Disturbance
Benjamin Voss, Michael Ruderman, Johann Reger
16:20-16:40
AMC24-000005 Practical Prescribed-Time Tracking Control of the Air-Bearing Testbed With Output Constraints
Di Jiang, Huaiyuan Jiang
16:40-17:00
AMC24-000083 Towards Virtual Commissioning Environment for Smart Mechatronic Systems
Tuojian Lyu, Udayanto Atmojo, Valeriy Vyatkin
17:00-17:20
AMC24-000016 Incipient fault motion signal generation for electric motor drives considering structure-electric interactions
BEOM-JIN JOE, Suk-Yoon Hong, Jee-Hun Song, Hyung-Taek Kim, Jee-Yeon Jeon, Sang-Jae Yeo

19:00-21:00
Kyoto Tower Hotel
Banquet

Thursday, 29 February 2024

09:00-10:30
Science Hall
Plenary Session II
Speaker: Professor Marina Indri, Polytechnic University of Torino, Italy
Title: Autonomous mobile robots and manipulators in factory automation: from Industry 4.0 toward Industry 5.0
Chair: Yasutaka Fujimoto

10:30-10:50
Foyer
Coffee Break

10:50-12:10
Room A "SS: Novel Control Technology in Precision Motion Control for Mechatronic Systems I"
Chairs: Shota Yabui, Juan Padron
10:50-11:10
AMC24-000029 Walking Control using Final State Control of a Biped Walking Robot with a Bi-articular Muscle
Shohei Fukaya, Toshimasa Miyazaki, Juan Padron
11:10-11:30
AMC24-000056 Multirate Adaptive Robust Control with Friction Estimation and Compensation for Tilting Table Machine Tools
Chenyu GE, Nguyen Binh Minh, Hiroshi Fujimoto, Terada Yuki, Masataka Sakamoto
11:30-11:50
AMC24-000082 EKF estimation of sensor installation parameters for sensor fusion in drones and its observability analysis
Taiki Nozaki, Kazuma Sekiguchi, Kenichiro Nonaka
11:50-12:10
AMC24-000077 Mass Flow Rate Control with Compensation of Nonlinearity Using Valve Internal Variables
Koki Hattori, Wataru Ohnishi, Takafumi Koseki

Room B "SS : Intelligent Sensing and Control Applications for Human Assistive Systems"
Chairs: Takahiro Nozaki, Yuki Nishimura
10:50-11:10
AMC24-000119 Deep Learning Based Force-Sensor-Like Reaction Force Observer for Realization of Intelligent Force Sensing
Thao Tran Phuong, Kiyoshi Ohishi, Yuki Yokokura, Toshimasa Miyazaki
11:10-11:30
AMC24-000095 Experimental Evaluation of Vision-Based Automatic Imaging Algorithm for Asteroid Flyby Observation
Tsuyoshi Aramaki, Kikuko Miyata, Kenta Seki, Makoto Iwasaki
11:30-11:50
AMC24-000076 Adaptive Ground Clearance Control for Preparation for Fall in a Wearable Assistive Device
JIANCHENG NIE, Ming Jiang, Andrea Botta, Yusuke Sugahara, Yukio Takeda
11:50-12:10
AMC24-000019 Velocity Obstacle Considering Collision Prediction Time and Non-holonomic Constraint for Mobile Robot
Naoki Motoi, Yosuke Ueda

Room C "TT : Automotive and Vehicular Motion Systems I"
Chairs: Alejandro Astudillo, Kenta Nagano
10:50-11:10
AMC24-000093 Pedestrian Detection for Autonomous Mobile Robots Using 3D LIDAR
Kazuma Mine, Yasutaka Fujimoto
11:10-11:30
AMC24-000073 Analytical Planner and Replanner of Minimum-Time Trajectories for Unicycle Robots Moving in Corridors
Sonia De Santis, Alejandro Astudillo Vigoya, Wilm Decre, Jan Swevers
11:30-11:50
AMC24-000033 Two-Stage Hierarchical Motion Planning with Basis-Splines in Highway Environments
Philip Dorpmuller, Torsten Bertram
11:50-12:10
AMC24-000094 Inverted stabilization control of electric wheelchairs with Tristar wheel mechanism
NAOYA TANABE, Takumi Sakai, Naoto Sato, Yuki Mochida, Masami Iwase

12:10-13:10
Foyer
Lunch Break

13:10-14:30
Room A "SS : Novel Control Technology in Precision Motion Control for Mechatronic Systems II"
Chairs: Kenji Natori, Shota Yabui
13:10-13:30
AMC24-000075 Loop Shaping Method Based on Data Considering Mechanism Constraints for Each Actuator in DISO Magnetic Head Position Control System in HDDs
Haruki Murakami, Shota Yabui
13:30-13:50
AMC24-000085 Estimation of higher-order state variables by polynomial approximation considering quantization step size of encoder and the implementation on FPGA
Kosuke Numata, Wataru Ohnishi, Takafumi Koseki, Yusuke Nomura, Adiyasuren Altanbileg, Shuji Takada
13:50-14:10
AMC24-000092 High Precision Control for Twin-Drive System Based on Mode Decoupling with Virtual Viscosity: Equivalent Controller Transform for Machine Tool
Kota Fujimoto, Hiroshi Fujimoto, Yoshihiro Isaoka, Yuki Terada
14:10-14:30
AMC24-000117 A speed-up method of calculating grasp quality measure for optimal grasp by a robot hand
KOSUKE WATANABE, Congrui Liu, YASUMICHI AIYAMA

Room B "TT: Actuators and Sensors in Motion Control II"
Chairs: Thao Tran Phuong, Seiichiro Katsura
13:10-13:30
AMC24-000037 Passivity-Based Impedance Control of a Class of Nonlinear Actuators with Internal Dynamics
Gianluca Rizzello, Paolo Roberto Massenio
13:30-13:50
AMC24-000111 Data-driven iterative tuning based disturbance observer control for variable stiffness compliant actuator
Weipeng Zhang, Peng Yan
13:50-14:10
AMC24-000103 Modeling of Device Using Corona Discharge Considering Voltage Range Limitation and Delay

Shigeki Yashita, Hiroaki Katagiri, Tomoya Kitamura, Takahiro Nozaki

14:10-14:30

AMC24-000038 Closed Loop Positioning of a Dielectric Elastomer Actuator Driven by a Feedback-Controlled High Voltage Circuit

Carmen Perri, Paolo Roberto Massenio, David Naso, Gianluca Rizzello

Room C "TT: Automotive and Vehicular Motion Systems II"

Chairs: Naoki Motoi, Minoru Yokoyama

13:10-13:30

AMC24-000040 H4MPC: A Hybridization Toolbox for Model Predictive Control in Automated Driving

Leila Gharavi, Bart De Schutter, Simone Baldi

13:30-13:50

AMC24-000025 Ramp Merging Sequence and Trajectory Optimization for Connected and Autonomous Vehicles using Deep Reinforcement Learning

Chen Jiang, Haoji Liu, Chunlong Qiu, Sunan Zhang, Weichao Zhuang

13:50-14:10

AMC24-000043 Multi-policy Soft Actor-Critic Reinforcement Learning for Autonomous Racing

Feifan Tong, Ran Liu, Guodong Yin, Sunan Zhang, Weichao Zhuang

14:10-14:30

AMC24-000018 Vehicle Axle Acceleration Prediction: An Interpolation Approach

Ahmad Aboutorabi, Matthias Brockmann

14:30-14:50

Foyer

Coffee Break

14:50-16:50

Room A "TT : Adaptive Control and AI in Motion Control Systems I"

Chairs: Juan Padron, Yuki Yokokura

14:50-15:10

AMC24-000069 Bayesian parameter auto-tuning for ADRC based PMSM speed regulation

Zezhou Lv, JINYA SU, Shihua Li

15:10-15:30

AMC24-000067 Remarks on an Optimal Predictive Control Using a Quaternion Neural Network-based Identifier

Kazuhiko Takahashi, Remi Aoki, Eri Kagamiishi, Masafumi Hashimoto

15:30-15:50

AMC24-000039 Dynamic Modeling of Strip Rolling Process Using Probabilistic Neural Network

Jifei Deng, Seppo Sierla, Jie Sun, Valeriy Vyatkin

15:50-16:10

AMC24-000031 Machine Direction Registration Modelling in Roll-to-Roll Screen Printing by Deep Learning

Anton Gafurov, Daehyeon Kim, Yuchang Choi, Hyejin Park, Inyoung Kim, Dongho Oh, Taik-Min Lee

16:10-16:30

AMC24-000074 Nonlinear Dynamical System Identification under External Disturbances by Maximum a Posteriori (MAP) Estimation for Robotics

Daisuke Yanabe, Suguru Kanoga, Vincent Fremont, Toshiyuki Murakami

16:30-16:50

AMC24-000112 Velocity- and Load-dependent Joint Friction Identification for a 6-DOF Industrial Robot

Minh Trinh, Gianluca Faggian, Matteo Bottin, Giulio Rosati, Oliver Petrovic, Christian Brecher

Room B "TT: Actuators and Sensors in Motion Control III"

Chairs: Gianluca Rizzelo, Nobuyuki Kurita

14:50-15:10

AMC24-000024 Disturbance Compensation of a Superconductor-based Levitation Module using a Parallel Actuator-Sensor System

Martin Rupp, Michael Schottner, Oliver Sawodny

15:10-15:30

AMC24-000036 Development of A Magnetically Levitated Suspension/Rotation Mechanism for Measuring Roll Damping Coefficient of a Hayabusa Capsule

Nobuyuki Kurita, Mitsushina Shinkai, Yukiyasu Takemura, Seiji Hashimoto, Yohei Takahashi, Takashi Ozawa

15:30-15:50

AMC24-000072 Model Identification of Soft Robotic Tongue Mimicking English Pronunciation Movements

Evan Krisdityawan, Sho Yokota, Akihiro Matsumoto, Daisuke Chugo, satoshi muramatsu, Hiroshi Hashimoto

15:50-16:10

AMC24-000044 EMG-Powered Motion Analysis and Upper-Limb Muscle Training Based on Hexagon Output Distribution

Matteo Pavia, Toshiyuki Murakami

16:10-16:30

AMC24-000102 Development of Fully Tendon-Driven Lightweight Manipulator with Constant Tendon-Length Routing

Shunichi Sakurai, Seiichiro Katsura

16:30-16:50
AMC24-000116 Development of 4-DOF Tendon-driven Robot Finger
Kei Ueda, Seiichiro Katsura

Room C "TT: Advanced Motion Control II"
Chairs: Yutaka Uchimura, Tomoyuki Shimono
14:50-15:10
AMC24-000011 Rapid Deployment of Model Predictive Control for Robotic Systems: From IMPACT to ROS 2 Through Code Generation
Alejandro Astudillo Vigoya, Alvaro Florez, Wilm Decre, Jan Swevers
15:10-15:30
AMC24-000059 Teleoperation of mobile robots based on MPC with time-varying delay
Hodaka Aoyama, Yuki Yamanaka, Naoki Matsuura, Yutaka Uchimura
15:30-15:50
AMC24-000041 Advanced hybrid control of mobile cable-driven parallel robot with 8-cables
Byeong-Geon Kim, Dong-Yeop Shin, Kyoung-Su Park
15:50-16:10
AMC24-000081 Trajectory Planning for Contactless Belongings Inspection Using UGV with Consideration of Detectable Range of THz Sensors
Yuki Uchida, Tomohito Watanabe, Teppei Tsujita, Daisuke Sato, Satoko Abiko, Shunsuke Yamada
16:10-16:30
AMC24-000087 Development of ceiling board opening robot for installing electric light and air conditioning equipment
Issa Omura, Ryo Oyori, Masami Iwase
16:30-16:50
AMC24-000101 Loss Function Considering Dead Zone for Neural Networks
Kouki Inami, Koki Yamane, Sho Sakaino

17:30-19:00
Atrium
Light Cocktail Party

Friday, 1 March 2024

09:00-10:30
Science Hall
Plenary Session III
Professor Jun Ueda, Georgia Institute of Technology, USA
Title: Physiological Digital Twin for Connected Healthcare
Chair: Tomoyuki Shimono

10:30-10:50
Foyer
Coffee Break

10:50-11:50
Room A "SS : Innovative Vehicle Motion Control: Emphasizing Smart and Energy-efficient Solutions"
Chairs: Leila Gharavi, Hiroshi Fujimoto
10:50-11:10
AMC24-000010 High Efficiency Three-Phase Inverter for Motor Drive using HEECS Chopper
Yoshiki Nasu, Yasuhiko Miguchi, Hidemine Obara, Atsuo KAWAMURA
11:10-11:30
AMC24-000089 Optimal Energy Trajectory Generation Based on Pitch-Dependent Mutual Inductance Model for In-Flight Inductive Power Transfer of Drones
Kota Fujimoto, Hiroshi Fujimoto, Alessandro Correa Victorino, Pedro Castillo
11:30-11:50
AMC24-000017 Dynamic Programming Application For Pseudospectral Optimal Train Control Problem
Nagarjuna Reddy Muraka, Masafumi Miyatake, Joao Victor Pinon Pereira Dias

Room B "TT : Micro- and Nano-Mechatronics and High-Precision Motion Control"
Chairs: Wataru Ohnishi, Kenta Seki
10:50-11:10
AMC24-000109 Modeling and Identification of Inter-Stage Couplings and Disturbances in a High-Precision Nanopositioning and Nanomeasuring Machine
Josias Ruhle, Oliver Sawodny
11:10-11:30
AMC24-000006 Harvesting Energy and Stability Insights in Internally Coupled Resonator Systems
Hossein Alimohammadi
11:30-11:50

AMC24-000107 Learning Disturbance Observer-based Repetitive Control with Application to Fast Tool Servo System
Yajie Jing, Beibei Hou, Pengbo Liu, Shuaishuai Lu, Peng Yan

Room C "TT: Advanced Motion Control III"
Chairs: Yoshiyuki Hatta, Takashi Yoshioka
10:50-11:10
AMC24-000090 Imitation Learning Inputting Image Feature to Each Layer of Neural Network
Koki Yamane, Sho Sakaino, Toshiaki Tsuji
11:10-11:30
AMC24-000032 Utilizing Hand-Eye Active Visual Servoing for Automated Bolt Removal
Kensei Tanaka, Shogo Arai
11:30-11:50
AMC24-000084 Application of Data-driven Simulation using CDDS Approach to Actuation Systems
Naoki Kameya, Lang Bu, Yasutaka Fujimoto
11:50-12:10
AMC24-000008 Recursive vehicle mass identification based on Unscented Transformation
Gael Parfait ATHEUPE

12:10-13:10
Foyer
Lunch Break

13:10-15:10
Room A "TT : Adaptive control and AI in motion control systems II"
Chairs: Sho Sakaino, Ouyang Huimin
13:10-13:30
AMC24-000079 Visualization of Environmental Information Based on MDK Channels in a Two-dimensional Plane
Yuki Tanaka, Sora Yamaguchi, Seiichiro Katsura
13:30-13:50
AMC24-000099 Motion Generation in Hybrid Control Converted from Human Motion Data
Kazuki Yane, Takahiro Nozaki
13:50-14:10
AMC24-000007 A Method for Generating Positioning and Anti-sway Trajectories for Rotary Cranes Considering Constraints and Obstacle Avoidance Problems
hongjie zhu, Ouyang Huimin, Xi Huan, Yi hui, Yougang Sun
14:10-14:30

AMC24-000053 A Reinforcement Learning Based Super Twisting Controller for a Rotary Slosh Control Problem
ASHISH KUMAR SHAKYA, Gopinatha Pillai, Sohom Chakrabarty
14:30-14:50
AMC24-000062 Evaluation of hand pose techniques numerical teaching materials of 5-degree-of-freedom with camera control
Kazu-masa YAMADA
14:50-15:10
AMC24-000028 Machine Learning-Based Deformation Estimation for Grasping 3D Soft Objects
Jiayi Xu, Yasumichi Aiyama

Room B "TT : Force Control, Haptics, and HMI"
Chairs: Daisuke Haraguchi, Tomoyuki Shimono
13:10-13:30
AMC24-000012 Soft-tissue Deformation Model for Virtual Reality-based Surgery Training Using Unity3D
Dhanya Menoth Mohan, Bijan Shirinzadeh, Yongmin Zhong, Julian Smith, Armin Ehrampoosh
13:30-13:50
AMC24-000013 Workspace Bilateral Control Based on Load-side Acceleration Control and Load-side Observers for Two-inertia Systems
Satoshi Igarashi, Yuki Yokokura, Kiyoshi Ohishi
13:50-14:10
AMC24-000035 Sensorless Haptic Force Presentation using Force-Projecting Bilateral Control with Pneumatic Manipulator
Yuki Monden, Daisuke Haraguchi
14:10-14:30
AMC24-000078 A Prevent of Motion Causing Accidents in Orthopedic Surgery by Teleoperated Haptic Drill
Takuya Matsunaga, Shunya Takano, Tomoyuki Shimono, Kouhei Ohnishi, Mitsuru Yagi, Masaya Nakamura
14:30-14:50
AMC24-000086 Enhanced Environmental Data Acquisition via Optimal Contact Strategies with Frequency-Tailored Commands
Sora Yamaguchi, Seiichiro Katsura
14:50-15:10
AMC24-000113 Vibration Supression Method Using Back-EMF for Reaction Force Control
Akinori Yabuki, Toshiyuki Kanmachi, Toshimasa Miyazaki

Room C "TT: Advanced Motion Control IV"
Chairs: Kenji Natori, Dapeng Tian
13:10-13:30
AMC24-000100 Modulation-Frequency-Dependent Power Dissipation Model for Servo Drives With Adaptive PWM
Manuel Weiss, Florian Frick, Armin Lechler, Alexander Verl
13:30-13:50
AMC24-000034 Current Vector Control of AC Servo Motor Considering Output Delay of PWM Inverter
Shimamoto Haruta, Takashi Yoshioka, Shiro Urushihara
13:50-14:10
AMC24-000066 Prescribed Performance Sliding Mode Controller for SVPWM Directly Driven PMSM
Jinsong Zhou, Dapeng Tian
14:10-14:30
AMC24-000050 Proposal of feedforward trajectory control with iterative learning for a musculoskeletal system
Kazuki Senda, Koichi Komada, Tetsuya Morizono, Yuki Matsutani, Kenji Tahara, Hitoshi Kino
14:30-14:50
AMC24-000098 Adaptive tracking control for a class of exoskeletons with saturation inputs and external disturbances
Fei Fan, Faxiang Zhang, Guanbin Gao, Jing Na, Yashan Xing, Yingbo Huang
14:50-15:10
AMC24-000063 Design of Elbow Joint Mechanism with Biomimetic Tendon-Ligament Arrangement by Elastic Belts
Takuya Shibata, Takahiro Inoue

15:20-15:40
Science Hall
Closing Ceremony

ICM2025 CfP

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The 2025 IEEE International Conference on Mechatronics (ICM'25) will be held from **February 28th – March to 2nd, 2025, at the University of Wollongong (UOW) in Wollongong, NSW, Australia**. As a flagship biennial conference on Mechatronics sponsored by the IEEE Industrial Electronics Society, ICM'25 will bring the international mechatronics community together in Wollongong to present the latest research results, share new ideas and engineering breakthroughs and discuss the state-of-the-art challenges and future directions in mechatronics.

The organising committee cordially invites high-quality papers representing original work, including but not limited to the following topics:

- Adaptive and Intelligent Control Systems
- Advanced Motion Control in Mechatronics
- Autonomous Robotic Systems, Artificial Intelligence and Machine Leaning
- Automotive Control and Transportation Systems
- Biomechatronics and Bioengineering Systems
- Compliant and Soft Robotics
- Haptics and Human-Robot Interaction
- Industry Applications, Information Technology and Advanced Manufacturing
- Micro-Electro-Mechanical Systems (MEMS) and Nanotechnologies
- Network-based Control Systems and Applications
- Sensors and Actuators
- Smart Materials and Structures in Mechatronics
- Visual Servo Systems, Machine Vision and Image Processing in Mechatronics

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Important Dates

Special Session Proposal:	October 14 2024
Full Paper Submission:	November 4 2024
Notification of Acceptance:	December 9 2024
Final Paper Submission:	January 13 2025

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