IFTOMM ISRM 2026

VINUNIVERSITY

HỘI CƠ HỌC VIỆT NAM

ĐẠI HỌC BÁCH KHOA HÀ NỘI
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

THE 9TH IFTOMM INTERNATIONAL SYMPOSIUM ON ROBOTICS AND MECHATRONICS

ISRM 2026 HANDBOOK

JULY
15-17
HANOI, VIETNAM

IFTOMM ISRM 2026 | VINUNIVERSITY | HỘI CƠ HỌC VIỆT NAM | ĐẠI HỌC BÁCH KHOA HÀ NỘI HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

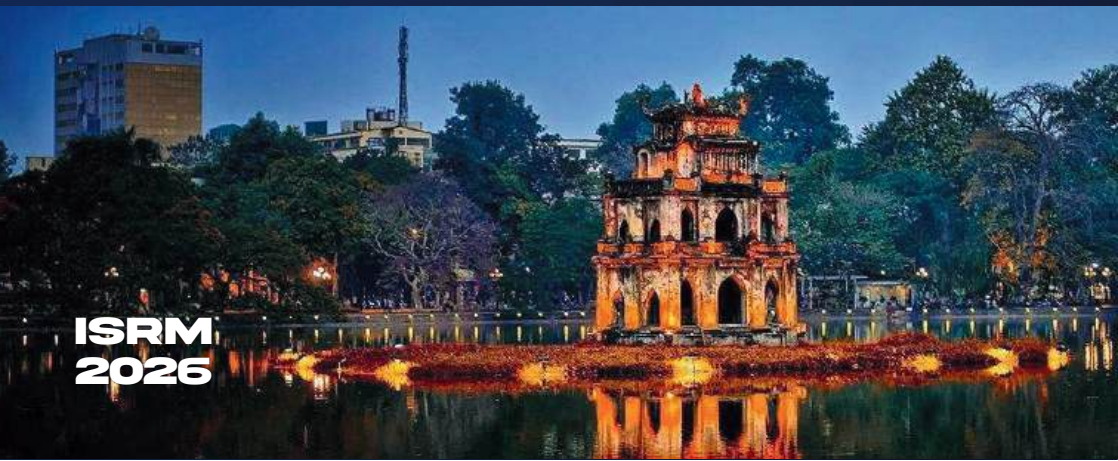
WELCOME TO HANOI

Located along the banks of the Red River, Hanoi - the capital of Vietnam - is a city where centuries of history harmoniously blend with the energy of modern development. From the historic Old Quarter and peaceful lakes to contemporary art spaces and rapidly growing innovation hubs, Hanoi offers visitors a unique experience that reflects both the charm of the past and the aspirations of the future. The city's tree-lined boulevards, local cuisine, and welcoming atmosphere will definitely create an environment that is both dynamic and memorable for international guests.

Beyond its cultural identity, Hanoi is increasingly emerging as a center for education, technology, and global collaboration. Hosting ISRM 2026 in Hanoi reflects the city's growing role in advancing scientific research, innovation, and interdisciplinary exchange in Vietnam and the region.

We hope your time at ISRM 2026 will not only provide meaningful academic discussions and professional connections but also an opportunity to experience the spirit and character of Hanoi.

Best regards,
ISRM 2026 Organizing Committee



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The 9th IFToMM International Symposium on Robotics and Mechatronics is a premier international forum dedicated but not limited to the advancement of robotics, mechatronics, and intelligent mechanical systems.

The symposium aims to bring together leading researchers, engineers, and practitioners to share their latest findings, exchange innovative ideas, and explore collaborative opportunities. ISRM 2026 covers a wide range of topics, including robotic systems, mechanism design, automation, control systems, artificial intelligence integration, and emerging applications in industry and society.

With the rapid development of intelligent technologies, robotics and mechatronics are playing an increasingly critical role in shaping the future of manufacturing, healthcare, transportation, and daily life. ISRM 2026 serves as a platform to address these developments and discuss challenges and opportunities in the field.

The program includes keynote speeches by distinguished experts, technical paper presentations, and interactive discussions designed to foster knowledge exchange and professional networking.

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VinUniversity is a private, not-for-profit Vietnamese university built according to international standards, incorporating the finest models of global higher education. Its objective is to create a breakthrough in the quality of higher education in Vietnam and achieve global recognition within 30 years of its establishment.

The mission of VinUniversity is to train a talented workforce with expertise, skills, personal development, and a dedication to achieving the highest possible effectiveness, contributing to the prosperity of individuals, society, and making a positive impact on the global knowledge-based economy.

As the Platinum Sponsor of ISRM 2026, VinUniversity is devoted to supporting academic excellence, advancing international research collaboration, and fostering innovation across engineering, science, technology, and emerging interdisciplinary fields.

IFToMM

Founded after the Second World War, **IFToMM** aims to promote international collaboration in mechanism and machine science by connecting researchers across countries and cultures. It supports this mission through conferences, technical committees, awards, student activities, and global cooperation to advance research and address future engineering challenges.

The Young Delegates Program (YDP) provides financial support to young scientists and engineers with limited funding to attend IFToMM technical conferences. Eligible participants must be under 37 years old in the conference year and belong to an IFToMM Member Organization. The program covers up to 50% of eligible expenses (registration, travel, accommodation, and meals), with a maximum support of USD 500, subject to the participant's institutional funding. Funding requests are submitted by the Conference Corresponding Chair on behalf of eligible participants.

CONFERENCE SCHEDULE

Day 1 | Wednesday | July 15, 2026

Time	Event	Location
08:00 - 09:00	Registration	Hall outside I201
09:00 - 09:10	Welcome speech Group photo	I201
09:10 - 10:10	**Keynote session #01** Robotics, Physical & Industrial AI – Big Integration for Solving Real World Challenges *Prof. I-Ming Chen, Nanyang Technological University*	
10:10 - 10:40	**Coffee break**	
10:40 - 12:20	**Oral presentation session #01 (1)** *Mechanism Design and Kinematics* *(Chair: Amine Laribi)* • **Paper 22 (10:40 - 11:00)**: Pedagogical Design Optimization of a 3-RRR Parallel Manipulator *Nguyen, M.* • **Paper 74 (11:00 - 11:20)**: Extending Magnetic Gravity Compensation Stroke Using Supplementary Linear Springs *Li, S., Zeng, X., Kuo, C., Li, W.* • **Paper 37 (11:20 - 11:40)**: Kinematic Calibration of a Sarrus-Based Mobile Manipulator. *Thảo, T., Le Thi Ha, M., Chu Quang, C.* • **Paper 40 (11:40 - 12:00)**: *Design and Multi-Objective Optimization of a Double-Guide-Rod Sliding Pillar Suspension Corner Module* *Bu, X., Li, Y., Chen, J., Chen, X.* • **Paper 51 (12:00 - 12:20)**: *A Magnetically Compliant Actuator Concept with Infinite Rotational Compliance using a Cylindrical Halbach Array* *Benten, A., Kuo, C., Roberts, J., Sariyildiz, E.*	I201

CONFERENCE SCHEDULE

Day 1 | Wednesday | July 15, 2026

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<td rowspan="2">10:40 - 12:20</td>
<td>Oral presentation session #02 (1)
Mechatronic Systems and Actuation
(Chair: Latifah Nurahmi)
• Paper 28 (10:40 - 11:00): Large Amplification and Self-Releasing Function Electrothermal-Actuated Microgripper
Pham Hong, P., Nguyen Ngoc, M.
• Paper 32 (11:00 - 11:20): LLM-Guided Reinforcement Learning for Dynamic Navigation: Characterizing the Benefits and Limits of Language Assistance in a Fire Disaster Scenario
Tan, Y., Soh, G.
• Paper 33 (11:20 - 11:40): Design and experimental validation of a two-layers Kalman filter-based multi sensor localization fusion for a Mecanum wheeled mobile robot
Trinh, L.
• Paper 35 (11:40 - 12:00): Load Adaptive Gravity Balanced integrated Actuator (LAGBA)
Kidanmariam, A., Nguyen, V., Lin, P.
• Paper 39 (12:00 - 12:20): High-accuracy three-dimensional angular measurement of spherical joints based on spherical encoding and eddy current sensors
Yang, L., Li, R., Ouyang, K., Hu, P.</td>
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<tr>
<td>Oral presentation session #03 (1)
Mobile Robotics and Autonomous Systems
(Chair: Phung Manh Duong)
• Paper 15 (10:40 - 11:00): Effect of Gear Helix Angle on Mechanical Losses in a Two-Speed I-AMT for Electric Vehicles
Nguyen Hong, T.
• Paper 86 (11:00 - 11:20): Multi-AGV control system for cooperative tasks in warehouses based on Multi-agent Reinforcement Learning
Truong, M., Pham, D., Tran, V.
• Paper 26 (11:20 - 11:40): Motion-Primitive Navigation of a Flix-Walker under Payload and Friction Variations
Vuong, D., Nguyen, T., Nguyen-Thai, M., Truong-Quoc, C.
• Paper 49 (11:40 - 12:00): Adaptive Super-Twisting Sliding Mode Control for Coaxial Octorotor UAV subject to model Uncertainties and External Disturbances
Trinh, L.
• Paper 55 (12:00 - 12:20): Design and Development of a Modular Swerve-drive Testbed for Experimental Research on Highly Maneuverable Mobile Robots
Duc Nam, N., Dinh-Trung, N., Nguyen Cong Hong, P.</td>
<td>C204</td>
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<td>12:20 - 13:30</td>
<td colspan="2">Lunch break</td>
<td>Canteen</td>
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</table>

CONFERENCE SCHEDULE

Day 1 | Wednesday | July 15, 2026

13:30 - 14:30	**Keynote session #02** Human-Centered Mechatronics: How Wearable Human-Machine Interfaces *are Redefining Assistive and Interactive* Technologies *Prof. Gursel Alici, University of Wollongong*	I201
14:30 - 15:00	**Coffee break**	
15:00 - 17:00	**Oral presentation session #04 (1)** *Dynamics, Control, and Learning* *(Chair: Shaoping Bai)* • **Paper 31 (15:00 - 15:20)**: Lightweight Machine Learning for Edge-Based Machinery Fault Diagnosis *Nguyen, T., Dien Nguyen, P., Truong-Quoc, C., Nguyen, M., Ngo, N., Le, P.* • **Paper 44 (15:20 - 15:40)**: Neural Adaptive Extended State Observer Based on Radial Basis Function Networks for Robust Active Suspension Control *Nguyen, T., Tran, T., Nguyen, T., Tran, Q., Nguyen, M.* • **Paper 71 (15:40 - 16:00)**: History-Conditioned Neural Inverse Kinematics for Redundant Manipulators *Nguyen, D., Scalera, L., Nguyen, V.* • **Paper 94 (16:00 - 16:20)**: A Recovery Approach for Cable-Driven Parallel Robots after Cable Breaks based on Reinforcement Learning *Gust, P., Heckes, H., Bruckmann, T.* • **Paper 93 (16:20 - 16:40)**: Physics-Consistent Sparse Lagrangian Regression for Multibody Dynamics Identification *Nguyen, D., Nguyen, V., Do, T., Nguyen, V.*	I201
	Oral presentation session #05 (1) *Medical and Assistive Robotics* *(Chair: Giuseppe Carbone)* • **Paper 103 (15:00 - 15:20)**: Mechanical Design for Body Weight Support Systems: A Review *Duc Toan, L., Nguyen, V.* • **Paper 19 (15:20 - 15:40)**: Conceptual Design and System Architecture of a Bowden-Driven Soft Shoulder Exosuit for Rehabilitation *Zhetenbayev, N., Bizhanov, D.* • **Paper 62 (15:40 - 16:00)**: A Fully Intra-Operative Method for Craniotomy Trajectory Generation *Tawan, S., Essomba, T.* • **Paper 90 (16:00 - 16:20)**: A Hybrid Actuated Shoulder Exoskeleton for Performance Enhanced and Energy-efficient Upper Arm Support *Majumder, A., Wagner, J., Zhu, Y., Souza Oliveira, A., Bai, S.* • **Paper 113 (16:20 - 16:40)**: Coexistence of Multi-Robot System in Surgical Platform *Trabelsi, A., Sandoval, J., Mlika, A., Laribi, A.*	C203

CONFERENCE SCHEDULE

Day 1 | Wednesday | July 15, 2026

15:00 - 17:00	**Oral presentation session #06 (1)** *Industrial Robotics and Manufacturing* *(Chair: Yu-Ren Wu)* • **Paper 58 (15:00 - 15:20)**: Development of a Prototype of an Eggplant Stem-Removing Machine *Tran, X., Nguyen, N., nguyen, V.* • **Paper 64 (15:20 - 15:40)**: Flight Simulation Programming For Cessna 172 During Cruising *Ly, K., Ly, H., Le, T., Bạch, T., Nguyen, T., Duong, N.* • **Paper 79 (15:40 - 16:00)**: Mathematical Modeling of CNC Power Skiving for Manufacturing Offset Helical Face Gears Using A Cylindrical Cutter *Le, K., Wu, Y., Luu, T.* • **Paper 80 (16:00 - 16:20)**: Development of a Prototype of an Automated Banh Gio Production Machine *Đinh, T., Nguyen, N., nguyen, V.* • **Paper 77 (16:20 - 16:40)**: Time-of-Flight Estimation Method for Ultrasonic Thickness Measurement Based on Fuzzy Variable Step-Size LMS *Yang, D., Zheng, Z., Li, R.*	C204
17:00 - 19:00	Welcome reception	2nd floor, Building I

CONFERENCE SCHEDULE

Day 2 | Thursday | July 16, 2026

Time	Event	Location
08:30 - 09:00	Registration	Hall outside I201
09:00 - 10:00	**Keynote session #03** Human-Adaptive Cyber-Physical Robotic Systems for Sustainable and Resilient Construction *Prof. Hongnian Yu, Edinburgh Napier University*	I201
10:00 - 10:30	**Coffee break**	
10:30 - 12:10	**Oral presentation session #01 (2)** *Mechanism Design and Kinematics* *(Chair: Nguyen Quang Hoang)* • **Paper 61 (10:30 - 10:50)**: Development and Performance Analysis of a 3DOF Haptic Joystick Utilizing Three Rotary MR Brakes *Nguyen, Q., Le, H., Diep, B.* • **Paper 23 (10:50 - 11:10)**: Conceptual Design of a Magnet-Spring Mechanism for Generation of Passive Constant Forces *Zeng, X., Nguyen, V.* • **Paper 87 (11:10 - 11:30)**: Design of a Novel Automobile Windshield Wiper Mechanism by the Compound Non-circular Gear Train with an Improved Cycloid Profile *Nguyen Hong, T.* • **Paper 96 (11:30 - 11:50)**: Modeling and Simulation of a Translational Flexible Manipulator Using The Rigid Finite Element Method *Quang Hoang, N., Nguyen, Q., Nguyen, S.* • **Paper 117 (11:50 - 12:10)**: Design and Mobility Assessment of a Flexure Based Coupling Using Screw Algebra *Chaudhary, V., Khatait, J.*	I201

CONFERENCE SCHEDULE

Day 2 | Thursday | July 16, 2026

10:30 - 12:10	**Oral presentation session #02 (2)** *Mechatronic Systems and Actuation* *(Chair: Thai Mai Thanh)* • **Paper 53 (10:30 - 10:50):** Modular Piggyboard-Based Segmented I²C Architecture for Deterministic Multi-Sensor Integration in Mechatronic Systems *Ochsendorf, M., Keunecke, S., Hüsing, M., Corves, B., Schulz, V.* • **Paper 45 (10:50 - 11:10)**: Development of a micro-force electric contact probe using micro tungsten ball tip *Yao, P., Li, R.* • **Paper 54 (11:10 - 11:30)**: Reaction-Time Feasibility of Distributed Ego-Centric Time-of-Flight Sensors for Speed and Separation Monitoring *Keunecke, S., Ochsendorf, M., Ebeling, R., Hüsing, M., Corves, B.* • **Paper 67 (11:30 - 11:50)**: Diffusion-Based Multi-Agent Formation Tracking: Experimental Comparisons *Do, H., Truong-Quoc, C., Tran Van, Q.*	C203
	Oral presentation session #03 (2) *Mobile Robotics and Autonomous Systems* *(Chair: Po Ting Lin)* • **Paper 18 (10:30 - 10:50)**: Enhancing LiDAR SLAM Reliability Through Neural Network–Driven Reflector Detection *Nguyen Hong, T.* • **Paper 101 (10:50 - 11:10)**: Deep Long-Term Ship Motion Prediction with Anomaly Detection for Autonomous Maritime UAV Landing *Nguyen, T., Vochten, M., Chaudhary, H., De Cubber, G.* • **Paper 105 (11:10 - 11:30)**: Graduated Dwell-Time Hysteresis for Mode-Switching Stability in Multi-Modal Mobile Robots *To Minh, H., Ngo Thi Thuy, D., Pham Tien, D., Phung Van, H., Le Minh, K., Nguyen Van, T., Giang Quoc, H., Ha Thanh, S., Nguyen Kim, T., Nguyen, Q.* • **Paper 60 (11:30 - 11:50)**: Dense Semantic SLAM using TSDF Mapping and Deep Learning-based Loop Closure *Tran Hoang, H., Tran, V., Duc Nam, N., Nguyen Cong Hong, P.*	C204
12:10 - 13:30	**Lunch break**	**Canteen**

CONFERENCE SCHEDULE

Day 2 | Thursday | July 16, 2026

13:30 - 14:30	**Keynote session #04** Vietnam's Robotics Moment: Building a Global-Standard Robotics Ecosystem from Southeast Asia *Prof. Hung La, University of Nevada & VinDynamics*	I201
14:30 - 15:00	**Coffee break**	
15:00 - 16:40	**Oral presentation session #04 (2)** *Dynamics, Control, and Learning* *(Chair: Xiangxian Zeng)* • **Paper 104 (15:00 - 15:20)**: Robust Deep Reinforcement Learning Control via Active Disturbance Rejection for Nonlinear Robotic Manipulators *Vu, X., Nguyen, V., Duc Toan, L., Nguyen, D., Nguyen, V.* • **Paper 106 (15:20 - 15:40)**: ODE vs DAE Formulations for Dynamic Simulation of a Four Bar Mechanism *Kumar, S., Servajean, R.* • **Paper 107 (15:40 - 16:00)**: Motion Control of Mobile Cable-Driven Parallel Robot via Gain Scheduling Strategy *Nurahmi, L., Rabani, F., Pramujati, B., Wasiwitono, U., Syamlan, A., Caro, S.* • **Paper 110 (16:00 - 16:20)**: An Inverted Compass Model for Passive Dynamic Brachiation *Kumar, S., Karthikeyan, N., Varma, V., Yang, X., Piiroinen, P., Chittawadigi, R.* • **Paper 112 (16:20 - 16:40)**: Gradient-Based Inverse Design of Kresling Origami via Neural Surrogate Modeling *Trung, V., Thứ, N., Nguyen Nhu, T., Thảo, T., Truong-Quoc, C.*	I201
	Oral presentation session #05 (2) *Medical and Assistive Robotics* *(Chair: Terence Essomba)* • **Paper 115 (15:00 - 15:20)**: Control Design for a Macro-Mini Robotic System in Robot-Assisted Percutaneous Interventions *Orozco Romo, C., Esmeral, K., Trabelsi, A., Sandoval, J.* • **Paper 102 (15:20 - 15:40):** Multimodal Smart Glove for Sign Language Recognition Using Deep Learning *Thu, N., Duong, P., Vu Linh, N., Trương, T., Anh, N.* • **Paper 2 (15:40 - 16:00)**: *Design of a 4-DOFs Low-Cost Robotic Hand with Ergonomic Palm and Opposable Thumb* *Huan, H., Zeng, D., Hu, Y., Carbone, G.* • **Paper 16 (16:00 - 16:20)**: Preliminary Implementation for Teleoperated Guided Spinal Cervical Surgery Drilling with Haptic Feedback *Sellemi, S., CHAKER, A., VENDEUVRE, T., Essomba, T., Laribi, A.*	C203

CONFERENCE SCHEDULE

Day 2 | Thursday | July 16, 2026

15:00 - 16:40	**Oral presentation session #06 (2)** *Industrial Robotics and Manufacturing* *(Chair: Nguyen Trong Du)* • **Paper 95 (15:00 - 15:20)**: Nonlinear Dynamic Modeling and Synthetic Data Generation for Multi-Fault Diagnosis in Rotor Systems: A 3D Multibody Case Study *Nguyen, T., Nguyen-Thai, M., Hoang, V., Manh-Tuan, L., Tran-Chinh, V.* • **Paper 83 (15:20 - 15:40)**: ARDF: an Advanced Robot Description File for parallel robots *Finkbeiner, F., Trunzer, J., Hufnagel, T., Bruckmann, T.* • **Paper 85 (15:40 - 16:00)**: *Design, Fabrication, and Performance Evaluation of a Multifunctional Pneumatic Gripper for Automated Logistics Parcel Handling* He, X., Kuo, C. • **Paper 68 (16:00 - 16:20)**: Dimensional Synthesis and Development of a Mechanized Eyeglass Cleaning System *Saluja, G., Sahu, M., B, A., B P, D., Chittawadigi, R.* • **Paper 84 (16:20 - 16:40)**: An Improved Design Method of Internal-meshing Skiving Cutter for Interference-Free Machining of Screw Rotors *Wu, Y., Nguyen, H.*	C204
16:40 - 17:30	Bus from VinUniversity to Conference Banquet	2nd floor, Building I
17:30 - 21:00	Conference Banquet	Almaz

CONFERENCE SCHEDULE

Day 3 | Friday | July 17, 2026

REGISTERED ONLY

09:00 - 17:00	Hanoi City Tour	Hanoi City Center

KEYNOTE SPEAKERS

1. PROF. I-MING CHEN

PROFESSOR, SCHOOL OF MECHANICAL & AEROSPACE ENGINEERING
DIRECTOR, INTELLIGENT SYSTEMS CENTRE
SCHOOL OF MECHANICAL AND AEROSPACE ENGINEERING (MAE)
NANYANG TECHNOLOGICAL UNIVERSITY, SINGAPORE

BIBLIOGRAPHY:
Professor I-Ming Chen received B.S. degree from National Taiwan University in 1986, and M.S. and Ph.D. degrees from California Institute of Technology, Pasadena, CA in 1989 and 1994 respectively. He is currently Full Professor in the School of Mechanical and Aerospace Engineering, Director of Bachelor's Degree Program in Robotics, and Co-Director of CARTIN (Center for Advanced Robotics Technology and Innovation) in Nanyang Technological University (NTU), Technical Advisor to National Robotics Program Office in Singapore, and Certified Patent Valuation Analyst (CPVA).

He was Editor-in-chief of IEEE/ASME Transactions on Mechatronics from 2020 to 2022, and Director of Robotics Research Centre (NTU) from 2013 to 2017. Professor Chen is Fellow of Singapore Academy of Engineering (SAEng), Fellow of IEEE and Fellow of ASME, General Chairman of 2017 IEEE International Conference on Robotics and Automation (ICRA 2017) in Singapore. His research interests are in Robot AI & perception, reconfigurable industrial AI, logistics and construction robots and human-robot interaction. He founded and managed Transforma Robotics Pte Ltd – a pioneer in construction robotics and Hand Plus Robotics Pte Ltd – a logistics robot and AI company. He has mentored many robotics-related startups and entrepreneurial teams in Singapore, China and Taiwan.

TOPIC

ROBOTICS, PHYSICAL & INDUSTRIAL AI – BIG INTEGRATION FOR SOLVING REAL WORLD CHALLENGES

Global industries face critical pressures, including acute manpower shortages and aging populations, necessitating a transition from manual robotic programming to a holistic system perspective. This keynote explores the integration of robotics and AI through a hierarchical structure, moving from top-level business and supply chain planning down to autonomous, machine-level execution. Central to this framework is Physical AI, which differs from digital-only models by requiring a sophisticated, inseparable bond between hardware and software. Successful real-world deployment relies on "Domain Data"—the specialized expertise and field experience accumulated within specific industries—to ensure robustness in non-standardized environments. We will discuss practical applications in sectors such as food handling, intelligent logistics, hospital supply and cleaning automation, where AI-driven 3D perception and grasp planning enable robots to navigate high-mix tasks previously reserved for human workers.

These systems represent a "Hybrid Automation" approach, combining AI's high-level decision-making with deterministic, safety-critical motion control. Looking forward, the next frontier in Embodied AI involves pushing intelligence down to the most granular level. Our future work conceptualizes Embedded AI for robotic joint actuators, introducing a "neuromuscular-inspired" reflex layer.

By embedding fast-real time intelligence directly into the robot's "muscles," we aim to create actuators that are self-aware and proactive, capable of responding to electrical or mechanical shocks and adapting to their own fatigue states independent of a central controller. Drawing on 30 years of R&D and entrepreneurial experience, I will outline how this systematic integration allows robots to complement human skills. While the journey toward AGI and widely deployed humanoids continues, our immediate focus remains on building a robust, hierarchical intelligence framework to ensure industrial systems are reliable, cost-effective, and sustainable.

KEYNOTE SPEAKERS

2. PROF. GURSEL ALICI

EXECUTIVE DEAN, ENGINEERING AND INFORMATION SCIENCES
FACULTY OF ENGINEERING AND INFORMATION SCIENCES
UNIVERSITY OF WOLLONGONG, AUSTRALIA

BIBLIOGRAPHY:

Professor Gursel Alici (Senior Member, IEEE) received the Ph.D. degree in robotics from the Department of Engineering Science, Oxford University, Oxford, U.K., in 1994. He is currently a Senior Professor with the University of Wollongong, Wollongong, NSW, Australia, where he holds the position of the Executive Dean of the Faculty of Engineering Information Sciences, and director of Applied Mechatronics and Biomedical Engineering Research (AMBER) Group. His research interests include soft robotics, system dynamics and control, robotic drug delivery systems, novel actuation concepts for biomechatronic applications, robotic mechanisms and manipulation systems, soft and smart actuators and sensors, wearable human-machine interface (HMI) systems, and medical robotics. He has generated more than 400-refereed publications and delivered numerous invited seminars and keynote/plenary talks on his areas of research. Dr. Alici was a Senior Editor and Technical Editor for the IEEE/ASME Transactions on Mechatronics during 2020–2024 and 2008–2012, respectively.

From 2007 to 2017, he was a Member of the Mechatronics National Panel formed by the Institution of Engineers, Australia. He has served on the international program committee of numerous IEEE/ASME International Conferences on Robotics and Mechatronics. He was the General Chair of the 2013 IEEE/ASME International Conference on Advanced Intelligent Mechatronics held in Wollongong, Australia. He was the recipient of the Outstanding Contributions to Teaching and Learning Award in 2010, the Vice-Chancellor's Interdisciplinary Research Excellence Award in 2013, and Vice-Chancellor's Award for Research Supervision in 2018 from the University of Wollongong. He was a Visiting Professor with Swiss Federal Institute of Technology, Lausanne (2007, 2010), City University of Hong Kong (2014), University of Science and Technology of China (2015), and University of British Columbia, Canada (2019).

TOPIC

HUMAN-CENTERED MECHATRONICS: HOW WEARABLE HUMAN-MACHINE INTERFACES ARE REDEFINING ASSISTIVE AND INTERACTIVE TECHNOLOGIES

There is a growing need for robust, intuitive, and bidirectional human–machine interfaces (HMIs) to enable seamless interaction between humans and devices in human-in-the-loop mechatronic systems such as prosthetics, drones, and rehabilitation technologies. Effective HMIs must not only identify user intent and physiological states but also translate them into actionable signals to control and guide external devices. Most wearable HMIs rely on electrodes that noninvasively capture electrical or mechanical biosignals generated by neuromuscular or neuronal activity. These biosignals represent human intent and enable the control of assistive or interactive technologies, including prosthetic limbs, wheelchairs, rehabilitation devices, and other mechatronic systems.

This keynote will present an overview of state-of-the-art wearable HMI technologies, highlight the major challenges, and discuss promising research directions aimed at improving robustness, adaptability, and usability in real-world settings including human-centered mechatronics. Applications drawn from the speaker's research group will be showcased, including the control of a prosthetic hand, a drone, a robot manipulator, and a computer game. The talk will emphasize the essential role of interdisciplinary collaboration in advancing wearable HMIs and helping assistive and interactive robotic systems more closely replicate natural human functions—pushing the frontier of human–machine integration in modern mechatronics.

KEYNOTE SPEAKERS

3. PROF. HONGNIAN YU

PROFESSOR OF ROBOTICS AND INTELLIGENT SYSTEMS,
SCHOOL OF ENGINEERING AND THE BUILT ENVIRONMENT
EDINBURGH NAPIER UNIVERSITY, UNITED KINGDOM

BIBLIOGRAPHY:

Professor Hongnian Yu is a Professor in the School of Computing, Engineering and the Built Environment at Edinburgh Napier University, where he served as the Head of Research from 2019 to 2023. He received his Ph.D. degree from the University of Exeter, UK. Professor Yu is multi-disciplinarily educated with a divergent knowledge base in mechatronics and intelligent systems, having established a vast research network collaborating with partners across over 30 countries. His research primary focus lies in the synergy between Robotics and Intelligent Control, specifically developing adaptive and robust control methods for robot manipulators and mobile inertial robots. He is particularly interested in Applied Artificial Intelligence and data science, exploring how these tools can be integrated into digital healthcare and advanced manufacturing systems to solve real-world industrial challenges.

Throughout his career, Professor Yu has pioneered the application of Emerging Technologies, such as RFID and wireless systems, to enhance the efficiency of healthcare and production environments. He has led major international research consortiums, including the EPSRC Human Adaptive Mechatronics network and the EU FUSION project, focusing on how intelligent systems can better serve human needs. He currently serves as a Fellow of the IET, Fellow of the RSA, and a Senior Member of the IEEE.

TOPIC | HUMAN-ADAPTIVE CYBER-PHYSICAL ROBOTIC SYSTEMS FOR SUSTAINABLE AND RESILIENT CONSTRUCTION

Robotic applications can be understood across three phases based on environmental structure: mature industrial robots operating in highly structured settings; emerging service robots functioning in semi-structured environments such as inspection and logistics; and specialised systems designed for highly unstructured and hazardous contexts, including disaster response. Construction sites combine elements of all three yet remain fundamentally dynamic, uncertain, and human-intensive, which explains the persistent technical and socio-technical barriers to large-scale robotic deployment. This talk argues that overcoming these challenges requires a shift from conventional automation toward human-adaptive Cyber-Physical robotic systems that integrate AI-driven perception, real-time control, wearable sensing, digital twins, and human-in-the-loop intelligence to enable safe, resilient, and context-aware collaboration. Drawing on international research projects in adaptive robotics, human–robot interaction, and Cyber-Physical systems, the talk will examine enabling technologies, deployment constraints, and translational pathways, and will outline a forward-looking roadmap aligned with Industry 5.0 principles to accelerate sustainable, safe, and productive transformation of the construction sector.

KEYNOTE SPEAKERS

4. PROF. HUNG LA

ASSOCIATE PROFESSOR, DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
UNIVERSITY OF NEVADA, USA
FOUNDER & CHAIRMAN, VINDYNAMICS, VIETNAM

BIBLIOGRAPHY:

Dr. Jim (Hung) La is the Founder and Chairman of VinDynamics, backed by Vingroup. He is also the founder of AIR Corp, backed by SOSV, Gener8tor and Nevada Battle Born Growth. He is a Professor and Director of the Advanced Robotics and Automation Lab at the University of Nevada, Reno.

With over 20 years of robotic research experience, Dr. La has co-authored 2 patents and more than 170 publications, with 12 receiving best paper awards/finalists at top robotics conferences (e.g., ICRA, IROS). His AI-powered inspection software was licensed to Penta-Ocean Construction (Japan). He was a key contributor to the RABIT system for the US Federal Highway Administration and has managed 44 federally and industry-funded projects totaling over $12M. His honors include the 2023 UNR Established Innovator Award, the 2019 NSF CAREER Award, and two ASCE Charles Pankow Awards for Innovation (2014, 2025).

TOPIC

VIETNAM'S ROBOTICS MOMENT: BUILDING A GLOBAL-STANDARD ROBOTICS ECOSYSTEM FROM SOUTHEAST ASIA

The global robotics industry is at a historic inflection point, driven by converging advances in artificial intelligence, computing power, and hardware manufacturing. While Japan, South Korea, China, and the United States have long dominated this landscape, conditions are now emerging for Southeast Asia — and Vietnam in particular — to stake a meaningful claim in the next wave of robotics innovation. This keynote presents both a strategic thesis and a personal account. Drawing on over two decades of robotics research at leading U.S. universities, deep-tech entrepreneurship through AIR Corp, and leading VinDynamics under the Vingroup ecosystem, the speaker examines what it genuinely takes to build a globally competitive robotics company from Vietnam.

The talk analyzes the key pillars of a thriving national robotics ecosystem — talent development, deep-tech capital, industry-academia pipelines, and domestic market activation — while candidly addressing structural challenges including hardware supply chain dependencies, the absence of national robotics standards, and cultural barriers to robot adoption. The keynote closes with a call to action for the international research community and the next generation of Vietnamese engineers: the infrastructure, capital, and ambition to build world-class robotics in Vietnam are being built today.

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