IEEE Conference on Industrial Cyber-Physical Systems (ICPS)

Perth, Australia, 11-14 May 2026

https://icps2026.ieee-ies.org/

Proposal for an ICPS 2026 Special Session

- **Title of the proposed Special Session: Intelligent Monitoring and Control for of Advanced Engineering Systems**
- **Names, photos, very short bios, and emails of the organizers:**

Organizer 1: Xiang Yu, School of Automation Science and Electrical Engineering, Beihang University (e-mail: xiangyu_buaa@buaa.edu.cn)

Xiang Yu (Senior Member, IEEE) received the B.S., M.S., and Ph.D. degrees in automation science and engineering from Northwestern Polytechnical University, Xi' an, China, in 2003, 2004, and 2008, respectively. He is currently a Professor with the School of Automation Science and Electrical Engineering, Beihang University, Beijing, China. He has held research positions with Western University, London, ON, Canada, and Concordia University, Montreal, QC, Canada. He has authored more than 80 journal papers and a monograph. His research focuses on safety control, autonomous navigation, and control of UAVs. He is the Associate Editor for multiple journals, including IEEE/ASME Transactions on Mechatronics and Journal of Field Robotics.
Google Scholar: https://scholar.google.com/citations?user=6UgtuZ8AAAAJ&hl

Organizer 2: Dong Zhao, School of Cyber Science and Technology, Beihang University (e-mail: dzhao@buaa.edu.cn)

Dong Zhao (Senior Member, IEEE) received the B.E. degree in automation and the Ph.D. degree in control science and engineering from the Beijing University of Chemical Technology, Beijing, China, in 2011 and 2016, respectively. From 2017 to 2021, he was a Postdoctoral Research Fellow with the Institute for Automatic Control and Complex Systems, University of Duisburg-Essen, Duisburg, Germany, and the KIOS Research and Innovation Center of Excellence, University of Cyprus, Nicosia, Cyprus, respectively. Since 2022, he has been a Professor with the School of Cyber Science and Technology, Beihang University, Beijing, China. He servers as Associate Editor for IEEE Transactions on Industrial Electronics and IEEE Transactions on Industrial Informatics. His research interests include fault diagnosis, fault-tolerant control, cyber-physical systems, and cybersecurity.
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Organizer 3: Xiaoyu Guo, Department of Mechanical Engineering, City University of Hong Kong (e-mail: xiaoyguo@cityu.edu.hk)

Xiaoyu Guo (Member, IEEE) received the B.E. degree in Electrical and Electronic Engineering, M.Res (with Distinction) in Photonics Engineering, and Ph.D. in Electrical and Electronic Engineering from Beihang University, the University of Cambridge, and the University of Manchester, in 2018, 2019, and 2023, respectively. He is currently an Assistant Professor with the Department of Mechanical Engineering, City University of Hong Kong. He has published 40 papers in international journals, granted more than 20 invention patents, and granted 5 software copyrights. He has also led the development of over 20 commercialized hydrogen energy products, and also participated in the formulation of 4 hydrogen energy-related group standards. His research interests include resilient control of sustainable energy systems and hydrogen-based robotic systems.
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- **Technical outline and topics of the special session:**

  Outline (up to 100 words): This session focuses on emerging research in the monitoring and control of advanced engineering systems, with an emphasis on robotic systems, unmanned aerial vehicles (UAVs) and cyber-physical systems. It addresses innovative approaches designed to enhance the performance, security, and reliability of complex engineering systems. Discussions will cover recent advancements in real-time monitoring, adaptive control, autonomous decision-making, and system integration within intelligent engineering systems. Participants will engage with cutting-edge developments that contribute to the robustness, efficiency and intelligence of next-generation engineering systems in dynamic and uncertain operational environments.

  Topics:
  1. Advanced Control Strategies in Dynamic Unstructured Environments
  2. Machine Learning Approaches for Enhanced System Monitoring
  3. Security Challenges and Solutions in Advanced Engineering Systems
  4. Integration of Artificial Intelligence in Control Mechanisms
  5. Edge Computing for Efficient Monitoring and Control
  6. Sensor Fusion and Multi-sensor Data Processing in Cyber-Physical Systems
  7. Resilience Enhancement Strategies for Cyber-Physical Infrastructures
  8. Advanced Communication Protocols for Reliable System Operation
  9. Intelligent Monitoring Strategies for Efficient System Diagnosis

- **Technical track(s) with similar topics (clearly point out difference to the Track scope)**
  None

- **IES Technical Committees supporting the special session (if any)**
  Technical Committee: Industrial Cyber-Physical Systems
- Technical Committee: Data-Driven Control and Monitoring

- **At least 6 potential initial contributing authors (names, affiliations and institutional emails):**
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- **At least 10 potential reviewers (names, affiliations and emails):**

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- The proposers have read and adhere to the overall IEEE IES Special session conditions as shown on the website https://icps2026.ieee-ies.org/for_authors/index.html#call-for-special-sessions: YES