2026 第九届 IEEE 国际无人系统大会
特邀专题简介表

特邀专题名称

无人系统具身认知与可信决策

组织者

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3.周佳玲，教授，北京理工大学

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个人简介

吕跃祖，北京理工大学教授，博士生导师，国自然青年基金 B 类获得者，中国科协青托，北京市科技新星。分别于 2013、2018 年在北京大学获学士与博士学位。曾访问香港城市大学、德州农工大学卡塔尔分校、澳大利亚皇家墨尔本理工大学。研究方向包括集群协同决策与控制、自适应控制、鲁棒控制。发表 SCI 论文 80 余篇（含控制领域顶刊 IEEE TAC 和 Automatica 长文 9 篇，短文 8 篇，其他 IEEE 汇刊 40 余篇），出版中英文专著 5 部。主持国家自然科学基金等国家级项目 10 余项。曾获中国指挥与控制学会技术发明一等奖、科技进步一等奖，IEEE SMC 学会 Zadeh 最佳会议论文奖， IEEE 国际无人系统大会最佳论文奖，亚太神经网络学会（APNNS）青年研究者奖，日内瓦国际发明展金奖等。任 IEEE SMC Magazine 编委、AISE 青年编委，任 IEEE IES 工业信息学技术委员会秘书长、中国指挥与控制学会青工委委员、网络科学与工程专委会委员和集群智能与协同控制专委会委员、中国指挥与控制学会高级会员、IEEE Senior Member。

王化平，北京理工大学教授、博士生导师。主持国家自然科学基金优秀青年基金、面上项目、科技部重点研发计划青年科学家项目、北京市科技计划项目及区域联合重点项目等。主要从事仿生微机器人与医工融合交叉研究，在多尺度机器人设计与集成、柔性生物目标交互、多机器人协同操作等方向取得系

列成果。以第一/通讯作者在 Nature Communications、Science Advances、IEEE TRO 等发表高水平论文 50 余篇，申请中国/国际发明专利 30 余项，获机器人领域 top1 国际学术会议 ICRA-2021 最佳自动化论文奖（中国大陆首次、1997-今）等 10 余项国际学术奖励，出版学术专著 2 部并获批十三五国家重点出版规划项目、国家科学技术学术著作出版基金资助项目，担任 IEEE Transactions on Automation Science and Engineering、Cyborg and Bionic Systems、Research 等国际期刊编委会成员。

周佳玲，北京理工大学教授，博士生导师，国家级青年人才。聚焦无人系统协同控制与决策、集群博弈等研究，主持国家自然科学基金项目、军科委某工程项目、国家重点研发计划课题等。成果在权威期刊 JGCD、IEEE TAC、Automatica 等发表论文 40 余篇，出版专著 2 部。获中国指挥与控制学会青年科技奖、中国指挥与控制学会科学技术进步一等奖、中国仿真学会创新技术一等奖、日内瓦国际发明展金奖、Kimura 最佳论文奖、IEEE SMC 学会 Zadeh 最佳论文奖等。任/曾任 Asian Journal of Control、Guidance, Navigation and Control 期刊副主编，IEEE Systems, Man, and Cybernetics Magazine 客座编委。任 IEEE 工业电子学会工业信息学技术委员会副秘书长、中国指挥与控制学会具身智能专委会常务委员，IEEE Senior Member。

段培虎，北京理工大学教授，国家级青年人才项目获得者。2015 年本科毕业于华中科技大学机械设计专业，2020 年博士毕业于北京大学力学系统与控制专业。2019 年至 2025 年，先后在香港城市大学、香港科技大学、香港大学和瑞典 KTH 皇家理工学院从事研究助理和博士后研究工作。发表和录用控制领域 SCI 期刊和国际旗舰会议高水平论文 40 余篇，其中控制领域两大国际顶级期刊 Automatica 和 IEEE TAC 论文 12 篇、其他 IEEE 汇刊论文 12 篇。获 2025 年中国指挥与控制学会技术发明一等奖、2025 年“懋恂·北理”教师表彰大会优秀人才奖、2022 年 IEEE 国际无人系统大会最佳论文奖、2022 年 Asian Journal of Control 期刊杰出审稿人奖。担任多个国际会议特邀专题主席、International Journal of Advanced Robotic Systems 期刊客座编辑、

International Journal of Micro Air Vehicles 青年编委。指导学生获第二届集群智能技术挑战赛跨域赛道全国一等奖、第七届全球校园人工智能算法精英大赛全国总决赛一等奖。现任中国指挥与控制学会具身智能专业委员会常务委员、集群智能与协同控制专业委员会委员。

特邀专题简介

随着人工智能、自主控制与无人平台技术的快速发展，无人系统正加速向具身智能、群体协同和可信自治方向演进，并在国防、交通、海洋、能源等领域展现出广阔应用前景。本专题旨在汇聚无人系统、自动控制、人工智能与机器人领域的专家学者，围绕未来无人系统中的具身感知、世界模型构建、自主决策、协同控制与可信自治等关键问题开展交流，分享最新理论进展、关键技术突破与典型应用成果，推动相关领域的交叉融合与创新发展。

本专题涵盖但不限于以下研究方向：

- 无人系统具身感知与认知决策
- 面向无人系统的世界模型构建与学习
- 数据驱动的自主控制与智能规划
- 多无人系统协同感知、协同决策与协同控制
- 群体智能系统的分布式控制与优化
- 复杂环境下无人系统的鲁棒性与可信自治
- 强化学习、生成式智能与无人系统应用

IEEE ICUS 2026
Invited Session Summary

Title of Session

Embodied Cognition and Trustworthy Decision-Making for Unmanned Systems

Organizers

1. Prof. Yuezu Lv
Beijing Institute of Technology, China
2. Prof. Huaping Wang
Beijing Institute of Technology, China
3. Prof. Jialing Zhou
Beijing Institute of Technology, China
4. Prof. Peihu Duan
Beijing Institute of Technology, China

Biosketches of Organizers

Yuezu Lv received the B.S. degree in engineering mechanism and Ph.D. degree in mechanical systems and control from the College of Engineering, Peking University, Beijing, China, in 2013 and 2018, respectively. He is currently a Professor with School of Artificial Intelligence, Beijing Institute of Technology, Beijing, China. His research interests include cooperative control of multi-agent systems, adaptive control, robust control of uncertain systems, and distributed resilient control. He was a finalist for Zhang Si-Ying (CCDC) Outstanding Youth Paper Award in 2015. He received the 2021 APNNS Young Researcher Award by Asia Pacific Neural Network Society, the Lotfi A. Zadeh Best Conference Paper Award at IEEE ICCSS 2022, and the Best Paper Award at IEEE ICUS 2023. He is an AE of IEEE SMC Magazine, and is a young editorial board member of Artificial Intelligence Science and Engineering. He is an IEEE Senior member.

Huaping Wang is a Professor with the School of Mechatronical Engineering at Beijing Institute of Technology. He has led several major research projects, including the Excellent Young Scientists Fund and the General Program of the National Natural Science Foundation of China, as well as the Young Scientists Fund of National Key R&D Program of China. His research lies at the intersection of bionic microrobotics and biomedical engineering, with major contributions to multiscale robot design and integration, compliant interaction with biological targets, and multi-robot cooperative manipulation. He has published more

than 50 papers as first or corresponding author in leading journals, including Nature Communications, Science Advances, and IEEE Transactions on Robotics, and has filed over 30 Chinese and international invention patents. He has received more than 10 international academic awards, including the ICRA 2021 Best Automation Paper Award, and currently serves on the editorial boards of IEEE Transactions on Automation Science and Engineering, Cyborg and Bionic Systems, and Research.

Jialing Zhou received the Ph.D. degree in mechanical systems and control from Peking University, Beijing, China, in 2017. She is currently a Professor with the Advanced Research Institute of Multidisciplinary Science, Beijing Institute of Technology, Beijing, China. Her research interests include distributed control and optimization, guidance and control of flight vehicles, reinforcement learning, and networked games. She was selected as a Young Top-Notch Talent of the National Ten Thousand Talents Program and a recipient of the Young Elite Scientist Sponsorship Program from the China Association for Science and Technology. She serves as an Associate Editor for Asian Journal of Control. She is an IEEE senior member.

Peihu Duan received the B.S. degree in Mechanical Engineering from Huazhong University of Science and Technology, Wuhan, China, in 2015. He received the Ph.D. degree in Mechanical Systems and Control from Peking University, Beijing, China, in 2020. Currently, he is an assistant professor at Beijing Institute of Technology. From 2019 to 2025, he conducted research as a research assistant and postdoctoral fellow at City University of Hong Kong, Hong Kong University of Science and Technology, the University of Hong Kong, and KTH Royal Institute of Technology. He is a recipient of a national young talent project. His research focuses on distributed estimation and control for multi-agent systems, data-driven estimation and control, and resource scheduling in sensor networks.

Details of Session

With the rapid advancement of artificial intelligence, autonomous control, and unmanned platform technologies, unmanned systems are evolving toward embodied intelligence, swarm cooperation, and trustworthy autonomy, with broad application prospects in defense, transportation, maritime operations, energy, and other domains. This special session aims to bring together researchers and practitioners from unmanned systems, automatic control, artificial intelligence, and robotics to discuss key issues in next-generation unmanned systems, including embodied perception, world model construction, autonomous decision-making, cooperative control, and

trustworthy autonomy. It will provide a platform for sharing the latest theoretical advances, key technological breakthroughs, and representative applications, thereby promoting interdisciplinary integration and innovation in this rapidly developing field.

This special issue covers, but is not limited to, the following research directions:

- Embodied Perception and Cognitive Decision-Making
- World Modeling and Representation Learning
- Data-Driven Autonomous Control and Planning
- Cooperative Perception, Decision-Making, and Control
- Distributed Control and Optimization for Swarm Systems
- Robust and Trustworthy Autonomy in Complex Environments
- Reinforcement Learning, Generative Intelligence, and Applications