

2024 第七届 IEEE 国际无人系统大会

特邀专题简介表

特邀专题名称	异构无人集群智能管控技术
组织者	<ol style="list-style-type: none">1. 李 兵，研究员，航天七院七部2. 陈爱国，教 授，电子科技大学3. 刘 剑，副研究员，东南大学
个人简介	<p> 李兵，男，博士，研究员，航天七院七部领域专家，科技部专家库入库专家，中国航天科技集团青年拔尖人才，航天七院首届青年拔尖人才计划，四川省科青联理事，北京理工大学校外博士生导师，成都理工大学客座教授，四川省新制式轨道齿轮传动装备工程研究中心专家委员会成员，中国指挥学会智能博弈与兵棋推演专委会常务委员，专业特长无人作战装备体系总体技术、无人系统技术。获国防科技进步三等奖 1 项，集团科技进步二等奖 1 项，承担多项国家级项目，发表论文 23 篇，申请专利 22 项，编写专著一本。</p> <p> 陈爱国，男，电子科技大学教授、博士生导师。智能协同计算技术国家级重点实验室副主任，国家级人才，中国指挥与控制学会平行指挥控制与管理专委会副主任委员，全国信标委云计算标准工作组专家，天府青城计划天府科技菁英，电子科技大学校百人。研究方向包括：边缘智能计算、分布式机器学习、大数据智能处理与隐私保护等。授权发明专利 30 余项，参与制定云计算国家标准 4 项，发表学术论文 50 余篇，出版著作 3 部。曾获国家技术发明二等奖 1 项，四川省技术发明一等奖和四川省科技进步一等奖共 3 项。</p>



刘剑，男，东南大学自动化学院副研究员，博士生导师。近年来，共发表或接收 SCI/EI 期刊论文 50 余篇，其中第一/通信作者 SCI 论文 20 余篇。申请与受理国家发明专利 20 余项。荣获 2023 年中国自动化学会自然科学一等奖（4/5），2021 年中国自动化学会优秀博士学位论文奖，2021 年吴文俊人工智能优秀博士学位论文奖等荣誉。主持多项国家级、省部级和其他各类基金项目，包括国家自然科学基金（青年基金、面上项目），江苏省基础研究计划青年基金，中国博士后创新人才支持计划等。担任 IEEE/CAA Journal of Automatica Sinica 青年编委、智能科学与技术学报专题编委。

特邀专题简介

随着无人机战技性能的不不断提升以及战术战法的不断发展，加上自组网通信、人工智能、无人控制等技术的进步，迫切需提升无人集群智能管控能力。无人集群智能管控技术是无人机作战系统中的重要组成部分，承担了协同控制预警探测、多源信息融合处理、态势生成、威胁评估、任务规划与决策、火力分配、武器控制等功能，贯穿了全维感知、智能编组、决策分析、武器控制等作战全流程。无人集群智能管控技术研究在无人系统领域扮演着越来越重要的作用，是控制多平台、多种类无人武器资源实施联合打击作战的基础，也是提升无人集群作战整体效能重要手段。本特邀专题邀请以下与“异构无人集群智能管控技术研究”相关的包含创新思想、概念、新发现、改进以及新应用的原创新论文。

- 异构无人集群智能组群理论与方法
- 异构无人集群互联互通互操作技术
- 异构无人集群杀伤链（网）构建技术
- 异构无人集群指挥&控制技术

IEEE ICUS 2024

Invited Session Summary

Title of Session

Intelligent Management and Control Technology for Heterogeneous Unmanned Swarm

Organizers

1. Prof. Bing Li

System Engineering Institute of Sichuan Aerospace, China

2. Prof. Anguo CHEN

University of Electronic Science and Technology of China

3. Assoc. Prof. Jian Liu

Southeast University, China

Biosketches



Bing Li, male, Ph.D., Professor, Experts in the System Engineering Institute of Sichuan Aerospace, Experts in the Expert Database of the Ministry of Science and Technology, Selected into the Out-standing Youth Talent Plan, Visiting Professor of Chengdu University of Technology, Member of the Expert Committee of Sichuan New Standard Rail Gear Transmission Equipment Engineering Research Center. His research interests include unmanned combat equipment system and unmanned system technology. He has been awarded a second prize at the provincial and ministerial level and completed the integration verification and evaluation optimization technology of an unmanned system as the technical director and deputy director of the project office. He also participated in several important projects. He has published 23 high-level international journal papers, 22 patents and co-authored a book.



Aiguo CHEN received his Ph.D. degree in Signal and Information Processing from the Beijing University of Posts and Telecommunications, China in 2009. He was a visiting scholar at Arizona State University, USA from Jan. 2013 to Jan. 2014. He is currently a professor and doctoral advisor at the University of Electronic Science and Technology of China. His research interests include edge intelligent computing, distributed

machine learning, big data analytics, and privacy.



Jian Liu received the B.S. and Ph.D. degree from the School of Automation and Electrical Engineering, University of Science and Technology Beijing, in 2015 and 2020, respectively. From September 2017 to September 2018, he was a joint training student with the Department of Mathematics, Dartmouth College, Hanover, NH, USA. From 2020 to 2021, he was a Postdoctoral

Fellow with the School of Automation, Southeast University, Nanjing, China, where he is currently an Associate Professor. His current research interests include multi-agent systems, nonlinear control, event-triggered control, fixed-time control, cooperative control.

Details of Session

With the continuous improvement of UAV combat performance and tactical tactics, as well as the progress of ad hoc network communication, artificial intelligence, unmanned control and other technologies, there is an urgent need to improve the intelligent management and control capabilities of unmanned swarm. Heterogeneous unmanned swarm intelligent management and control technology is an important part of the unmanned combat system, which undertakes the functions of collaborative control and early warning detection, multi-source information fusion processing, situation generation, threat assessment, mission planning and decision-making, firepower distribution, weapon control, etc., and runs through the whole combat process such as full-dimensional perception, intelligent grouping, decision-making analysis, and weapon control. The research on intelligent management and control technology of unmanned swarm plays an increasingly important role in the field of unmanned systems, which is the basis for controlling multi-platform and multi-type unmanned weapon resources to carry out joint strike operations, and is also an important means to improve the overall efficiency of unmanned swarm operations.

The invited session invites original papers of innovative ideas and concepts, new discoveries and improvements, and novel applications relevant to the following selected topics of “Intelligent management and control technology for heterogeneous unmanned swarm”.

- Theory and method of heterogeneous unmanned swarm intelligent grouping
- Heterogeneous unmanned swarm interconnection and interoperability

technology

- Heterogeneous unmanned swarm kill chain (network) construction

technology

- Heterogeneous unmanned swarm command & control technology