2025 第八届 IEEE 国际无人系统大会
特邀专题简介表

特邀专题名称
大规模开放式无人集群协同安全控制及其性能评估

组织者

1. 叶　磊，副研究员，国防科技大学
2. 张佳龙，工程师，国防科技大学
3. 田栢苓，教授，天津大学
4. 郑震山，研究员，海军研究院
5. 周中良，教授，空军工程大学
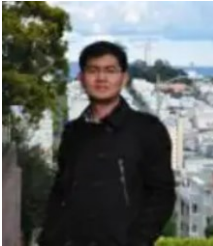6. 张婷婷，教授，陆军工程大学
7. 任友成，副研究员，军事科学院
8. 李其东，讲师，陆军工程大学

个人简介

叶磊，副研究员，硕导，无人中心主任，美国加州大学伯克利分校访问学者，主要从事地面无人平台环境感知与路径规划方面的研究工作。

张佳龙，工程师，国防科技大学试验训练基地，主要研究方向集群协同控制、集群空中联合作战闭环杀伤链。

田栢苓，教授，天津大学，主要研究方向为高超声速飞行器与无人集群有限时间控制及应用。

郑震山，研究员，海军研究院，主要研究方向为体系设计。

周中良，教授，空军工程大学，主要研究方向为无人装备试验鉴定。

张婷婷，陆军工程大学教授，首届江苏青年女科学家、江苏省"333 高层次人才培养工程"中青年科学技术带头人。其研究领域无人系统智能指挥控制、人工智能、强化学习与博弈论。

任友成，副研究员，空气动力试验基地第四试验部，主要研究方向模型飞行试验、微弱信号处理。

李其东，讲师，国防大学博士后，陆军工程大学训练基地，主要研究方向联合作战。

特邀专题简介

  随着空天技术的持续、迅猛发展，无人装备面临着环境复杂、任务多样、性能特殊等工况制约，使其无法有效地执行特殊任务。尤其，无人装备的特殊性能，即敏捷性、安全性以及智能评估，是制约能效倍增的核心。因此，对于无人集群协同安全控制与智能评估尤为重要，它是无人装备适应复杂动态环境和完成多样任务的基础和关键；其智能评估，则是降低无人装备试错成本，提高在复杂场景的泛化性和鲁棒性，从而更好地提高无人装备远域作战能力。同

时，对于无人装备性能摸底，能够促进无人集群协同安全技术创新和落地验证。

本特邀专题邀请以下与"大规模开放式无人集群协同安全控制及其性能评估"主题相关的包含创新思想、概念、新发现、改进以及新应用的原创论文。

- 无人自主系统协同理论方法
- 集群建模技术及其受扰下的模型
- 集群协同安全控制技术
- 集群系统动态通信组网互联互通新技术
- 集群敏捷协同探索技术
- 集群协同感知新技术
- 集群协同敏捷跟踪技术
- 集群协同试验技术
- 集群协同性能评估技术
- 集群自主决策与容错能力技术
- 集群智能评估体系化设计技术
- 与无人集群系统相关的技术和平台

Title of Session

Collaborative Security Control of Large-Scale Open Unmanned Clusters And Its Performance Evaluation

Organizers

1. Assoc. Prof. Lei Ye

Test Center, National University of Defense Technology, China

2. Dr. Jialong Zhang

Test Center, National University of Defense Technology, China

3. Prof. Bailing Tian

Tianjing University, China

4. Prof. Zhenshan Zheng

Naval Research Institute, China

5. Prof. Zhongliang Zhou

Air Force Engineering University, China

6. Prof. Tingting Zhang

Army Engineering University, China

7. Assoc. Prof. Youcheng Ren

Academy of Military Sciences, China

8. Dr. Qidong Li

Academy of Military Sciences, China

Biosketches of Organizers

Lei Ye is an Associate Professor, Master Director and Director of Unmanned Center, and Visiting Scholar at University of California, Berkeley, USA. He is mainly engaged in the research work on environment sensing and path planning of ground unmanned platforms.

Jialong Zhang is Engineer, Test Center, National University of Defense Technology. His main interest is direction cluster cooperative control and cluster air joint-combat closed loop kill chain.

Bailing Tian is a professor of Tianjin University. His major research interests are hypersonic vehicles and unmanned clusters finite time control and applications.

Zhenshan Zheng is a professor of Naval Research Institute, his main research interest is system design.

Zhongliang Zhou is a professor of Air Force Engineering University, his main research interest is unmanned equipment test qualification.
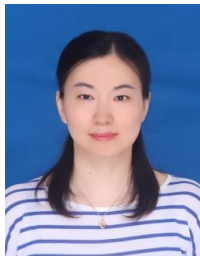
Tingting Zhang is a professor of Army Engineering University, a postdoctoral fellow of Southeast University, the first young female scientist of Jiangsu Province, and a young and middle-aged scientific and technological leader of Jiangsu Province's "333 High-level Talent Cultivation Project". Her research interests include intelligent command and control of unmanned systems, artificial intelligence, reinforcement learning and game theory.

Youcheng Ren is associate professor, and 4th Test Department of Aerodynamic Test Base, his main interests are model flight test and weak signal processing.
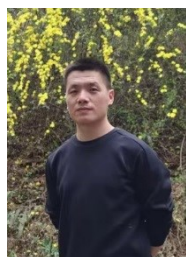
Qidong Li is lecturer, and a postdoctoral fellow at National Defense University, and Training Base of Army Engineering University. His main interest is joint warfare.

Details of Session

With the continuous and rapid development of air and space technology, unmanned equipment faces working condition constraints such as complex environments, diverse missions, and special performances, which prevent them from effectively performing special missions. In particular, the special performance of unmanned equipment, i.e., agility, safety, and intelligent assessment, is the core of the constraints on the multiplication of energy efficiency. Therefore, it is particularly important for unmanned clusters to collaborate on safety control and intelligent assessment, which is the foundation and key for unmanned equipment to adapt to complex dynamic environments and accomplish diverse tasks; and its intelligent assessment is to reduce the cost of trial and error of unmanned equipment and improve the generalization and robustness in complex scenarios, so as to better improve the unmanned equipment's far-area combat capability. At the same time, for unmanned equipment performance mapping, it can promote unmanned cluster cooperative security technology innovation and ground verification.

The following original papers containing innovative ideas, concepts, discoveries, improvements and applications related to the topic of "Distributed unmanned cluster cooperative security control and intelligent evaluation" are invited.

- Unmanned autonomous system collaboration theoretical approaches
- Cluster modeling technology and its model under disturbance
- Cluster collaboration safety control technology
- New technology of cluster system dynamic communication grouping network interconnection and intercommunication
- Cluster agile collaboration exploration technology cluster collaboration sensing technology
- Cluster collaboration agile tracking technology
- Cluster collaboration experimentation technology
- Cluster collaboration performance evaluation technology
- Cluster autonomous decision making and fault-tolerance capability technology
- Cluster Intelligent evaluation systematic design technology
- Technologies and platforms related to unmanned cluster systems