

# 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

面向低空场景的无人系统智能感知与自主控制

## 组织者

1. 阚梓，副教授，北京航空航天大学
2. 姚卓尔，助理研究员，北京航空航天大学
3. 别大卫，副研究员，天目山实验室
4. 李道春，教授，北京航空航天大学

## 个人简介



**阚梓**，北京航空航天大学副教授，先进长航时无人机系统技术教育部工程研究中心联系人，GF 科技大学学报青年编委，长期从事新型无人机设计方法、样机研制、无人机飞行动力学及控制等工作，主持国家自然科学基金、航空航天院所等项目 10 余项，发表 SCI 论文 30 篇，授权国家发明专利 30 余项，入选中国航空学会优秀博士学位论文，获得中国指挥与控制学会科技进步一等奖等省部级奖励 3 项。



**姚卓尔**，北京航空航天大学助理研究员，从事无人飞行器动力学建模与控制、高速物理反无人机等研究。主持杭州市自然科学基金、浙江省重点研发计划“尖兵”项目子课题等科研项目。在 Chinese Journal of Aeronautics, IEEE Transactions on Aerospace and Electronic System 等国际期刊发表学术论文 10 余篇，申请发明专利 20 余项，获中国航空学会技术发明二等奖、中国发明协会发明创业项目奖一等奖。



**别大卫**，天目山实验室副研究员，从事新能源无人机总体设计与气动优化、分布式旋翼气动优化等研究。主持浙江省自然科学基金、浙江省重点研发计划“尖兵”项目子课题等科研项目。在 Physics of Fluids 等国际期刊发表论文 20 余篇，申请发明专利 10 余项，获中国航空学会自然科学二等奖、中国

发明协会发明创业项目奖一等奖。



**李道春**，北京航空航天大学教授，博士生导师，国家级领军人才、先进长航时无人机系统技术教育部工程研究中心主任、智能无人飞行系统先进技术工信部重点实验室副主任、飞行器总体设计与系统工程学科方向带头人、校学术委员会委员。主持 GF 科技卓越青年科学基金、国家自然科学基金、科技部重点研发专项等 30 余项。发表 SCI 论文 50 余篇，授权国家发明专利 60 余项，获得省部级科技奖励 3 项。

### 特邀专题简介

随着人工智能、先进传感、智能控制等技术的快速发展，无人系统正逐步从单一功能执行向低空场景下的智能感知与自主控制方向演进。当前，以无人机为代表的低空无人系统已广泛应用于城市应急救援、环境监测、物流运输、基础设施巡检、资源探测、国防安全等领域，并在复杂城市空域、近地低空走廊以及多障碍物密集区域中发挥着越来越重要的作用。面对低空场景中非结构化、动态变化和强干扰的应用环境，传统方法在环境理解、任务感知、路径规划和自主控制等方面仍面临诸多挑战。因此，研究面向低空场景的无人系统智能感知与自主控制技术，对于提升无人系统在低空空间中的智能性、自主性、鲁棒性和适应性具有重要意义。

本特邀专题聚焦低空场景下无人系统在感知、决策、规划与控制等方面的前沿进展，旨在推动低空无人系统相关理论、方法与应用的创新发展。专题欢迎与“面向低空场景的无人系统智能感知与自主控制”相关的原创论文，包括但不限于以下方向：

- 低空无人系统智能感知与多源信息融合
- 低空环境下的目标识别与场景理解
- 低空无人系统自主导航与路径规划
- 低空无人系统自主决策与智能控制
- 多无人系统在低空空间的协同感知与协同控制

- 面向低空任务的无人系统学习与优化
- 低空无人系统的设计、验证与应用

# IEEE ICUS 2026

## Invited Session Summary

### Title of Session

Intelligent Perception and Autonomous Control of Unmanned Systems for Low-Altitude Scenarios

### Organizers

**1. Assoc. Prof. Zi Kan**

Beihang University, China

**2. Dr. Zhuoer Yao**

Beihang University, China

**3. Dr. Dawei Bie**

Tianmushan Laboratory, China

**4. Prof. Daochun Li**

Beihang University, China

### Biosketches of Organizers



**Zi Kan** is an associate professor at Beihang University, liaison of the Ministry of Education Engineering Research Center for Advanced Long-Endurance Unmanned Aerial Vehicle Systems, and a young editorial board member of the Journal of National University of Defense Technology. He has long been engaged in work on novel UAV design methods, prototype development, and UAV flight dynamics and control. He has led more than 10 projects, including those funded by the National Natural Science Foundation of China and major aerospace institutes, published 30 academic papers, and been granted over 30 national invention patents. He was selected for the Excellent Doctoral Dissertation Award of the Chinese Society of Aeronautics and Astronautics and has received three provincial/ministerial-level awards, including the First Prize for Science and Technology Progress of the Chinese Institute of Command and Control.



**Zhuoer Yao** is an assistant researcher at Beihang University, engaged in research on unmanned aerial vehicle dynamics modeling and control, as well as high-speed physical counter-UAV technologies. He has led research projects such as those funded by the Hangzhou Natural Science Foundation and Pioneer Leadership program of Zhejiang Province. He has published more than 10 academic papers in international journals such as the Chinese Journal of Aeronautics and IEEE Transactions on Aerospace and Electronic Systems, filed over 20 invention

patent applications, and received the Second Prize for Technological Invention from the Chinese Society of Aeronautics and Astronautics and the First Prize of the Invention and Entrepreneurship Project Award from the China Association of Inventions.



**Dawei Bie** is an associate researcher at Tianmushan Laboratory, engaged in research on overall design and aerodynamic optimization of new-energy UAVs and aerodynamic optimization of distributed rotors. He has led research projects including those funded by the Zhejiang Natural Science Foundation and Pioneer Leadership program of Zhejiang Province. He has published more than 20 papers in international journals such as *Physics of Fluids*, filed over 10 invention patent applications, and received the Second Prize for Natural Science from the Chinese Society of Aeronautics and Astronautics and the First Prize of the Invention and Entrepreneurship Project Award from the China Association of Inventions.



**Daochun Li** is a professor at Beihang University, a national leading talent, director of the Ministry of Education Engineering Research Center for Advanced Long-Endurance Unmanned Aerial Vehicle Systems, deputy director of the MIIT Key Laboratory of Advanced Technologies for Intelligent Unmanned Aerial Systems, academic leader in the discipline of aircraft overall design and systems engineering, and a member of the university's Academic Committee. He has led more than 30 projects, including the National Defense Science and Technology Excellent Young Scientists Fund, and the National Natural Science Foundation of China. He has published over 50 academic papers, been granted more than 60 national invention patents, and received three provincial/ministerial-level science and technology awards.

### **Details of Session**

With the rapid development of artificial intelligence, advanced sensing and intelligent control, unmanned systems are gradually evolving from single-function executors toward intelligent perception and autonomous control in low-altitude scenarios. At present, low-altitude unmanned systems represented by unmanned aerial vehicles (UAVs) have been widely applied in urban emergency response, environmental monitoring, logistics and transportation, infrastructure inspection, resource exploration, national defense and security, and other fields, and are playing an increasingly important role in complex urban airspace, near-ground low-altitude corridors, and obstacle-dense areas. In the face of unstructured, dynamically changing, and strongly disturbed application environments in low-altitude scenarios,

traditional methods still encounter numerous challenges in environmental understanding, task perception, path planning, and autonomous control. Therefore, research on intelligent perception and autonomous control technologies for unmanned systems in low-altitude scenarios is of great significance for enhancing the intelligence, autonomy, robustness, and adaptability of unmanned systems operating in low-altitude airspace.

This special issue focuses on the latest advances in perception, decision-making, planning, and control of unmanned systems in low-altitude scenarios, aiming to promote innovative development of related theories, methods, and applications for low-altitude unmanned systems. The special issue welcomes original papers related to “Intelligent Perception and Autonomous Control of Unmanned Systems for Low-Altitude Scenarios,” including but not limited to the following topics:

- Intelligent perception and multi-source information fusion for low-altitude unmanned systems
- Target recognition and scene understanding in low-altitude environments
- Autonomous navigation and path planning for low-altitude unmanned systems
- Autonomous decision-making and intelligent control for low-altitude unmanned systems
- Cooperative perception and cooperative control of multiple unmanned systems in low-altitude airspace
- Learning and optimization of unmanned systems for low-altitude missions
- Design, verification, and applications of low-altitude unmanned systems