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

空间系统的博弈决策与控制

组织者

1. 袁源，教授，西北工业大学

2. 袁欢欢，副教授，西北工业大学

3. 钟一凡，副教授，西安建筑科技大学

个人简介

袁源，1986 年生，陕西西安人。2009 年获北京航空航天大学学士学位，2015 年获清华大学计算机科学与技术博士学位。现为西北工业大学航天学院教授。主要研究方向包括动态博弈理论、抗攻击智能控制、抗干扰控制及多智能体分布式控制等。在复杂对抗环境下的智能决策与控制领域具有较为丰富的研究成果。

袁欢欢，分别于 2013 年和 2016 年在燕山大学获得学士和硕士学位，后于北京理工大学获得博士学位。现为西北工业大学航天学院副教授。主要从事博弈论及其在控制系统中的应用研究，致力于多智能体系统中的策略优化与协同控制问题，在相关研究方向开展了系统性探索。

钟一凡，1998 年生，山西大同人。毕业于西北工业大学航天学院，现为西安建筑科技信控学院副教授。主要从事多航天器系统协同控制、网络攻击与防御、博弈论及其在航天系统中的应用等方面研究。主要围绕复杂网络攻击环境下多智能体系统的协同决策与控制问题开展研究。

特邀专题简介

随着空间技术的不断发展，空间系统在在轨服务、空间探测、空间对抗及空间信息网络等领域中发挥着越来越重要的作用。空间系统由传统的单体运行

模式逐步向多航天器协同与智能化对抗方向发展，系统结构与任务形式日趋复杂，对自主性、协同性和智能决策能力提出了更高要求。

在复杂空间环境中，空间系统往往面临信息不完全、通信受限以及不确定扰动等问题，同时在部分任务场景中还存在对抗与竞争行为，这对系统博弈决策与控制能力提出了更高的要求。如何在复杂环境与对抗条件下实现空间系统的高效决策与稳定控制，已成为当前研究中的重要问题。围绕复杂任务需求，相关决策与控制方法不断发展，在空间系统中的应用日益广泛。

本特邀专题邀请与“空间系统的博弈决策与控制”相关的具有创新思想、方法及应用成果的原创论文，重点关注空间系统中的多主体协同与对抗决策问题，推动相关理论与工程应用的发展。

本专题征稿范围包括但不限于：

- 空间系统博弈建模与分析
- 空间对抗环境下的博弈决策与策略设计
- 分布式博弈与协同控制方法
- 不完全信息与不确定条件下的博弈决策
- 博弈学习与智能决策方法

IEEE ICUS 2026
Invited Session Summary

Title of Session

Game-Theoretic Decision-Making and Control for Space Systems

Organizers

1. Prof. Yuan Yuan
Northwestern Polytechnical University, China
2. Prof. Huanhuan Yuan
Northwestern Polytechnical University, China
3. Prof. Yifan Zhong
Xi'an University of Architecture and Technology, China

Biosketches s of Organizers

Yuan Yuan was born in Xi'an, China, in 1986. He received the B.S. degree from Beihang University in 2009 and the Ph.D. degree in computer science and technology from Tsinghua University in 2015. He is currently a Professor with the School of Astronautics, Northwestern Polytechnical University, China. His research interests include dynamic games, resilient control under attacks, anti-interference control, and distributed control of multi-agent systems.

Huanhuan Yuan received the B.S. and M.S. degrees from Yanshan University in 2013 and 2016, respectively, and the Ph.D. degree from Beijing Institute of Technology. She is currently an Associate Professor with the School of Astronautics, Northwestern Polytechnical University, China. Her research interests include game theory and its applications in control systems and multi-agent coordination.

Yifan Zhong, born in 1998 in Datong, Shanxi Province, graduated from the School of Astronautics at Northwestern Polytechnical University and is currently an Associate Professor at the School of Information and Control Engineering, Xi'an University of Architecture and Technology. His research focuses on cooperative control of multi-spacecraft systems, cyber attack, game theory, and their applications in aerospace systems.

Details of Session

With the rapid development of space technologies, space systems are

increasingly applied in on-orbit services, space exploration, space confrontation, and space information networks. The evolution from single-agent systems to multi-agent cooperative and competitive systems has significantly increased the complexity of system structures and mission requirements, posing higher demands on autonomy, coordination, and intelligent decision-making.

In complex space environments, space systems are often subject to incomplete information, communication constraints, and uncertainties. Meanwhile, competitive and adversarial interactions may arise in certain mission scenarios, leading to pronounced multi-agent decision-making characteristics. How to achieve efficient decision-making and reliable control under such complex and adversarial conditions has become a critical research problem. Related methods have been actively developed and have shown promising potential in various space applications.

This invited session aims to bring together recent advances in game-theoretic decision-making and control for space systems. Original contributions with innovative ideas, methods, and applications are particularly welcome.

Topics of interest include, but are not limited to:

- Game-theoretic modeling and analysis for space systems
- Decision-making and strategy design under adversarial space environments
- Distributed games and cooperative control methods
- Game-theoretic decision-making under incomplete information and uncertainties
- Game learning and intelligent decision-making methods