IFAC
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

CAA

哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY

中国航天 北京控制工程研究所
Beijing Institute of Control Engineering

23rd IFAC Symposium on Automatic Control in Aerospace, ACA 2025

FINAL PROGRAM

IFAC
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

CAA
中国自动化学会

哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY

中国航天 北京控制工程研究所
Beijing Institute of Control Engineering

第23届国际航空航天控制会议

程 序 册

Organizing Institutions: International Federation of Automatic Control (IFAC)

Chinese Association of Automation (CAA)

Host Institutions: Harbin Institute of Technology

Beijing Institute of Control Engineering

Co-Sponsored: State Key Laboratory of Micro-Spacecraft Rapid Design and Intelligent Cluster

National Key Laboratory of Complex System Control and Intelligent Agent Cooperation

State Key Laboratory of Space Intelligent Control

State Key Laboratory of Aerospace Intelligent Control and Manipulation Technology

National Key Lab of Space Target Awareness

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Beijing Nokov Science & Technology Co.,Ltd.

Technical Sponsoring: IFAC TC 7.3 Aerospace

Co-Technical Sponsoring: IFAC TC 9.4 Control Education

IFAC TC 7.5 Intelligent Autonomous Vehicles

Acta Automatica Sinica

Advances in Astronautics

Chinese Journal of Aeronautics

Science China Information Sciences

Science China Technological Sciences

Space: Science & Technology

主办单位： 国际自动控制联合会（IFAC）

中国自动化学会（CAA）

承办单位： 哈尔滨工业大学

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联合技术支持： IFAC TC 9.4 Control Education

IFAC TC 7.5 Intelligent Autonomous Vehicles

《自动化学报》

《宇航学报》

《航空学报》

《中国科学：信息科学》

《中国科学：技术科学》

《空间科学与技术（英文）》

Welcome Address

The 23rd IFAC Symposium on Automatic Control in Aerospace (IFAC- ACA 2025) will be held from August 2 - 6, 2025, at the Wanda Vista Hotel in Harbin, Heilongjiang Province, China. Co-sponsored by the International Federation of Automatic Control and the Chinese Association of Automation, the symposium is organized by Harbin Institute of Technology and the Beijing Institute of Control Engineering. The General Chair is Prof. Guangren Duan, Academician of the Chinese Academy of Sciences and Professor at Harbin Institute of Technology, while the Co-Chairs are Prof. Xibin Cao, Academician of the Chinese Academy of Engineering and Professor at Harbin Institute of Technology, and Researcher Yong Li, Director of Beijing Institute of Control Engineering.

The IFAC Symposium on Automatic Control in Aerospace (IFAC ACA) is held every three years, serving as a premier platform for experts, scholars, and engineers worldwide to exchange ideas on aerospace, automation theory, and applications. It aims to promote research advancements and foster collaboration in these fields.

This marks the first time the IFAC ACA symposium is being held in China. The conference received 527 submissions from 18 countries and regions, including China, the United States, Canada, France, Germany, South Korea, and Japan. After rigorous peer review, 461 papers were accepted, comprising 292 oral presentations and 169 poster presentations, with an acceptance rate of 87.48%. All accepted papers will be included in the IFAC-PapersOnLine database.

We are honored to have invited eleven distinguished plenary speakers: Prof. Klaus Schilling from the Center for Telematics, Germany; Prof. Olga Leonardovna Starinova from Samara National Research University, Russia; Researcher Yongchun Xie from the Beijing Institute of Control Engineering, China; Prof. Radhakant Padhi from the Indian Institute of Science, India; Prof. Lixian Zhang from Harbin Institute of Technology, China; Prof. Jinjun Shan from York University, Canada; Prof. Paolo Castaldi from the University of Bologna, Italy; Prof. Weidong Zhang from Shanghai Jiao Tong University, China; Prof. Haibin Duan from Beihang University, China; Prof. Liqun Chen from Harbin Institute of Technology, Shenzhen, China; and Researcher Yonghe Zhang from the Innovation Academy for Microsatellite of Chinese Academy of Sciences, China. Additionally, the symposium will host 27 oral sessions and 2 poster sessions for in-depth discussions.

On behalf of the Organizing Committee, International Program Committee, and Local Arrangements Committee, we extend our deepest gratitude to all authors, participants, reviewers, and program committee members for their rigorous evaluations. Special thanks to the plenary speakers for sharing their cutting-edge research, as well as to the organizers and volunteers for their dedicated efforts. We sincerely appreciate everyone who contributed to the success of this event.

Welcome to the 23rd IFAC Symposium on Automatic Control in Aerospace!

General Chair	Co-Chair	Co-Chair
Harbin Institute of Technology	Harbin Institute of Technology	Beijing Institute of Control Engineering

主席欢迎辞

第 23 届国际航空航天控制会议 (The 23rd IFAC symposium on Automatic Control in Aerospace, IFAC-ACA 2025) 将于 2025 年 8 月 2-6 日在黑龙江省哈尔滨市万达文华酒店召开。本次会议由国际自动控制联合会与中国自动化学会共同主办，哈尔滨工业大学和北京控制工程研究所承办。会议由中国科学院院士、哈尔滨工业大学段广仁教授担任总主席，中国工程院院士、哈尔滨工业大学曹喜滨教授和北京控制工程研究所所长李永研究员担任会议共主席。

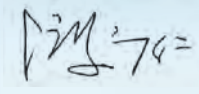
国际航空航天控制会议每三年举办一次。旨在为从事航空、航天、自动化理论与应用相关领域研究的国内外专家、学者及工程技术人员提供一个学术交流平台，更好地宣传航空、航天、自动化理论与应用领域的研究成果，推动理论与应用研究的发展。

本次会议是国际航空航天控制会议首次在中国举办。会议共收到来自中国、美国、加拿大、法国、德国、韩国、日本等 18 个国家和地区的 527 篇论文投稿。经过严格的评审，共录用论文 461 篇，其中口头报告 292 篇，海报论文 169 篇，总体录用率 87.48%。所有录用的论文将被收录到 IFAC-PapersOnLine 数据库。

大会很荣幸地邀请了 11 位国际知名学者作大会报告，他们是德国远程信息处理中心 Klaus Schilling 教授、俄罗斯萨马拉国家研究型大学 Olga Leonardovna Starinova 教授、中国北京控制工程研究所解永春研究员、印度科学理工学院 Radhakant Padhi 教授、中国哈尔滨工业大学张立宪教授、加拿大约克大学 Jinjun Shan 教授、意大利博洛尼亚大学 Paolo Castaldi 教授、中国上海交通大学张卫东教授、中国北京航空航天大学段海滨教授、中国哈尔滨工业大学 (深圳) 陈立群教授、中国中科院微小卫星创新研究院张永合研究员。此外，会议将安排 27 个口头报告组和 2 个张贴报告组供大家汇报交流。

在此，我谨代表会议主席团、国际程序委员会、程序委员会与组织委员会对所有作者及参会人员表示最衷心的感谢与最热烈的欢迎！感谢审稿人及程序委员会委员对投稿论文的严谨评审！感谢组委会和志愿者提供的热情服务！感谢大会报告人接受会议邀请，与大家一同分享他们最新的研究成果！向所有为本届会议顺利召开做出贡献的人士致以我们最真诚的谢意！

第 23 届国际航空航天控制会议欢迎您！



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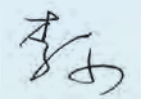

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- **Website of IFAC-ACA 2025:** https://ifac-aca-2025.hit.edu.cn
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IFAC-ACA 2025 Technical and Social Programme at a Glance

Time	Aug. 2	Aug. 3		Aug. 4			Aug. 5								Aug. 6
08:30-09:00		Grand Ballroom 2 & 3: Opening Ceremony		Grand Ballroom 2 Semi-Plenary talk 1 Dynamics and Control of Smart Structures for Space Applications Prof. Jinjun Shan, York University, Canada	宴会厅 3：航天控制论坛 特邀报告 1 鸟群智能激发汇聚启发的无人机集群自主控制 段海滨教授 北京航空航天大学	Function Room 1: Poster Session & Grand Ballroom Foyer: Exhibition Booths	Parallel Sessions 18-23						VIP Room: Excellent Thesis Defense	Grand Ballroom Foyer: Exhibition Booths	Tours
09:00-09:30		Grand Ballroom 2 & 3 Plenary talk 1: The Future in Space: Smarter, Smaller and More Cooperative Satellites Prof. Klaus Schilling Center for Telematics (ZfT), Wuerzburg, Germany	Grand Ballroom Foyer: Exhibition Booths	Semi-Plenary talk 2 Aerospace Control Education Prof. Paolo Castaldi, University of Bologna, Italy	特邀报告 2 基于全驱系统方法的无退绕航天器姿态控制 陈立群教授 哈尔滨工业大学（深圳）		Function Room 1 I	Function Room 2 I	Function Room 3 I	Meeting Room I	Grand Ballroom 2 I	Grand Ballroom 3 I			
09:30-09:45				Semi-Plenary talk 3 Key Technologies of UAV-USV Cooperation System for Maritime Search and Rescue Prof. Weidong Zhang, Shanghai Jiao Tong University, China	特邀报告 3 空间科学极限探测任务中的控制技术及前沿进展 张永合研究员 中国科学院微小卫星创新研究院		Autonomous Navigation and Control of Deep Space Probes	Aircraft Dynamics, Navigation, Guidance and Control	Resilient and Cooperative Guidance and Control of Aerial Vehicles	Artificial Intelligence-Based Attitude-Orbit Control for Multiple Spacecraft Systems	FAS Theory and Applications in Aerospace Control	Spacecraft Advanced Control for On-orbit Complex Missions			
09:45-10:15	/	Group Photo Session (Grand Ballroom)； Session break		Session break											
10:15-11:00		Grand Ballroom 2 & 3 Plenary talk 2: Optimal Solar Sail Control for Launching into Artificial Periodic Orbits near L2 of Earth-Moon System Prof. Olga Leonardovna Starinova Samara National Research University, Russia	Grand Ballroom Foyer: Exhibition Booths	Parallel Sessions 6-11		Function Room 1: Poster Session & Grand Ballroom Foyer: Exhibition Booths	II	II	II	II	II	II	VIP Room: Excellent Thesis Defense	Grand Ballroom Foyer: Exhibition Booths	
11:00-11:45		Grand Ballroom 2 & 3 Plenary talk 3: On Key Technologies for Spacecraft Intelligent Autonomous Control and Application Prospects Prof. Yongchun Xie Beijing Institute of Control Engineering (BICE), China		VIP Room: Guidance and Control for High-Speed Flight in Trans-Domain Complex Environment	Function Room 2: Space Intelligent Equipment: Technologies and Applications		Autonomous Navigation and Control of Deep Space Probes	Aircraft Dynamics, Navigation, Guidance and Control	Resilient and Cooperative Guidance and Control of Aerial Vehicles	Artificial Intelligence-Based Attitude-Orbit Control for Multiple Spacecraft Systems	FAS Theory and Applications in Aerospace Control	Spacecraft Advanced Control for On-orbit Complex Missions			
				Function Room 3: Advanced Propulsion	Meeting Room: Space Debris Mitigation										
				Grand Ballroom 2: Game Decision and Control for Non-Cooperative Space Targets	Grand Ballroom 3: Advanced Theories and Applications of Very Low Earth Orbit Spacecraft										
12:00-14:00		Grand Ballroom 1 & Lobby Western Restaurant: Lunch													
14:00-15:30	Lobby: Registration	Parallel Sessions 1-5 Function Room 1 / I: Swarm Intelligence in Aerospace Dynamics and Control Function Room 2 / I: Advanced Navigation, Control, and Swarm Coordination for Aircraft Cluster Function Room 3 / I: Advanced Control and Path Planning of Space Robots Grand Ballroom 2 / I: Micro- and Nano-Satellites and Education Grand Ballroom 3 / I: Space Traffic Management	Grand Ballroom Foyer: Exhibition Booths	Parallel Sessions 12-17 VIP Room / I: Intelligent Autonomous Swarm Perception, Decision-Making, Control, and Applications Function Room 2 / I: Contemporary Advances in AI and Its Application in Aerial Systems Function Room 3 / I: S1: On Advanced Filtering and Control for Complex New Space Missions S2: Health Monitoring, Diagnosis, and Reconfiguration Meeting Room / I: S1: Advanced Control of Large-Scale and Distributed Space Structures S2: Applications of Machine Learning in Rendezvous and Docking as well as Space Operations Grand Ballroom 2 / I: S1: Spacecraft Collision Threat Prediction and Autonomous Avoidance Control S2: Space Situation Awareness Grand Ballroom 3 / I: Advanced Information Fusion Technology for Aerospace Applications		Function Room 1: Poster Session & Grand Ballroom Foyer: Exhibition Booths	Parallel Sessions 24-27 Function Room 1: Advanced Safe Decision Making and Control for Aerospace Systems Function Room 2: Diagnosis, Maintenance, and Digital Simulation of LEO Constellation Satellites Function Room 3: Large-Scale Constellation Control and Management Meeting Room: Flexible Structure Control for Aerospace				Grand Ballroom Foyer: Exhibition Booths	/
15:30-16:00		Session break					Grand Ballroom 2 & 3 Plenary talk 4: Optimal Guidance in Soft-Landing of Chandrayaan-3 Prof. Radhakant Padhi Indian Institute of Science, India							Session break	
16:00-16:15		II Swarm Intelligence in Aerospace Dynamics and Control / II: Advanced Navigation, Control, and Swarm Coordination for Aircraft Cluster / II: Advanced Control and Path Planning of Space Robots / II: Micro- and Nano-Satellites and Education / II: Space Traffic Management	Meeting Room: TC Committee Meeting Grand Ballroom Foyer: Exhibition Booths	II Intelligent Autonomous Swarm Perception, Decision-Making, Control, and Applications / II: Contemporary Advances in AI and Its Application in Aerial Systems / II: S1: On Advanced Filtering and Control for Complex New Space Missions S2: Health Monitoring, Diagnosis, and Reconfiguration / II: S1: Advanced Control of Large-Scale and Distributed Space Structures S2: Applications of Machine Learning in Rendezvous and Docking as well as Space Operations / II: S1: Spacecraft Collision Threat Prediction and Autonomous Avoidance Control S2: Space Situation Awareness / II: Advanced Information Fusion Technology for Aerospace Applications		Function Room 1: Poster Session & Grand Ballroom Foyer: Exhibition Booths							Grand Ballroom Foyer: Exhibition Booths	
16:15-17:00							Grand Ballroom 2 & 3 Plenary talk 5: In-Cabin Robots for Space Stations: Research Status and Key Technologies Prof. Lixian Zhang Harbin Institute of Technology, China								
17:00-18:00							Grand Ballroom 2 & 3: Closing Ceremony								
18:00-20:00		Grand Ballroom 1 & Lobby Western Restaurant: Dinner					Lobby Western Restaurant / Grand Ballroom 1: Farewell Banquet								

地址注释：多功能厅 1—Function Room 1; 多功能厅 2—Function Room 2; 多功能厅 3—Function Room 3; 董事会议室—Meeting Room; 宴会厅 1—Grand Ballroom 1; 宴会厅 2—Grand Ballroom 2; 宴会厅 3—Grand Ballroom 3
贵宾厅—VIP Room; 美食汇西餐厅—Lobby Western Restaurant; 廊厅—Grand Ballroom Foyer.

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	Xianghong Xue	Xi'an University of Technology		
	Jianliang Zhang	Zhejiang University		
Poster Session Chair:	Haibin Shang	Beijing Institute of Technology		
Award Paper Chair:	Haibin Duan	Beihang University		
	Hyo-Sang Shin	Korea Advanced Institute of Science and Technology		
	Bin Zhou	Harbin Institute of Technology		
Publication Chair:	Aiguo Wu	Harbin Institute of Technology, Shenzhen		
Registration Chair:	Yunhua Wu	Nanjing University of Aeronautics and Astronautics		
Finance Chair:	Xueqin Chen	Harbin Institute of Technology		
Members:	Baichun Gong	Bicheng Cai	Bo Li	Boyu Yang
(Alphabetical order)	Cong Zhou	Haotian Zhao	Huaxin Qiu	Jiawei Huo
	Kaixin Cui	Keying Yang	Lang Lu	Liang Cui
	Liang Zhang	Lincheng Li	Peiji Wang	Peng Shu
	Qingjun Li	Qingxian Jia	Ruichen Xi	Ruiqi Dong
	Ruixia Liu	Sai Chen	Weiran Yao	Weixin Han
	Xiaobin Lian	Xiaozhe Ju	Xiubo Wang	Yan Xiao
	Yanjun Yu	Yaqi Zhang	Yonglong Zhang	Youmin Gong
	Yuandong Ji	Yudong Hu	Yuhe Mao	Zengfu Wang
	Zi Kan	Zichen Zhao		

口头报告与张贴报告要求
Instruction for Oral and Poster Presentations

口头报告 Oral Presentations

每篇论文报告时间为 15 分钟 (12 分钟讲解 +3 分钟交流)，语言为英语，报告人需要在会议开始前 15 分钟到达分会场将幻灯片文件的 PPT 版本和 PDF 版本同时复制到会务组指定的计算机上。每间分会场会议室会配备一个投影仪或电子屏幕，以及一台预装了演示软件，如微软 PowerPoint 和 Adobe Reader 的笔记本电脑。注：如果您计划使用自己的计算机，请在分会场报告的当天早上 8:30 之前或者 14:00 之前完成现场测试。口头报告论文编号请参见会议网站主页 (*https://ifac-aca-2025.hit.edu.cn/cn/2025/0617/c19538a372317/page.htm*)。

Each paper presentation is allocated 15 minutes (12 minutes for presentation + 3 minutes for discussion). The language of the presentation is English. Presenters are required to arrive at the session room 15 minutes before the session starts to copy both the PPT and PDF versions of their slide files to the computer designated by the organizing committee. Each session room is equipped with a projector or electronic screen, as well as a laptop pre-installed with presentation software such as Microsoft PowerPoint and Adobe Reader. Note: If you plan to use your own computer, please complete on-site testing before 8:30 AM or 14:00 PM on the day of your session presentation. For the list of oral presentation paper numbers, please refer to the conference website homepage(*https://ifac-aca-2025.hit.edu.cn/cn/2025/0617/c19538a372317/page.htm*).

张贴报告 Poster Presentations

张贴时间为 2025 年 8 月 4 日，语言为英语。具体安排为 : 08:30-12:00 展示论文编号为 Poster-01 至 Poster-85; 14:00-18:00 展示论文编号为 Poster-86 至 Poster-169。会议将为每篇张贴论文提供一块标准展板，请作者自行打印携带海报至现场并在 8 月 4 日 8:20/13:50 之前完成张贴。张贴报告要求尺寸为底宽 0.8m，高 1.2m，内容美观图面清晰，便于观者现场学习交流。张贴论文的左上角必须用醒目的新罗马字体注明：IFAC-ACA 2025- 稿件编号。报告纸张的背面不能带胶。现场免费提供张贴所需工具并协助张贴。注：如果个别论文作者因故无法自行携带报告到场，请联系会务承办方哈尔滨犄角文化传媒有限公司，可提供打印和张贴服务，联系人: *jijiaowenhua@163.com*。张贴报告论文编号请参见会议网站主页 (*https://ifac-aca-2025.hit.edu.cn/cn/2025/0617/c19538a372317/page.htm*)。

Poster presentations will take place on August 4, 2025 in English, with Poster-01 to Poster-85 from 08:30 to 12:00, and Poster-86 to Poster-169 from 14:00 to 18:00. The conference will provide a standard poster board for each paper. Authors must print and bring their own posters and complete setup before 8:20/13:50 on August 4. Poster size should be 0.8m wide × 1.2m high, with clear and visually appealing content. The top left corner must clearly display "IFAC-ACA 2025-Paper ID" in Times New Roman font. No adhesive should be on the back of posters. Mounting tools will be provided free on-site. If unable to bring posters, contact Harbin Jijiao Culture Media Co., Ltd. at *jijiaowenhua@163.com* for printing and posting services. Poster paper numbers are available at: (*https://ifac-aca-2025.hit.edu.cn/cn/2025/0617/c19538a372317/page.htm*).

会场交通及周边

哈尔滨万达文华酒店位于哈尔滨市松北区万达文化旅游城内，与冰雪乐园、万达茂、主题乐园和电影乐园仅咫尺之遥。

详细地址：哈尔滨松北区世茂大道 87 号。

抵达方式：

地点	直线距离 / 公里 (大约)
哈尔滨太平机场	38 公里
哈尔滨西站	35 公里

● 哈尔滨太平机场至哈尔滨万达文华酒店

1. 出租车：车程预计 40 分钟，费用约 95 元。

2. 公交：约 1 小时 50 分钟。

哈尔滨太平国际机场→机场大巴融创线→融创城站下车→步行 440 米到达宏源街→乘坐 396 路公交车→万达娱雪乐园下车→步行 340 米抵达万达文华酒店。

●哈尔滨西站至哈尔滨万达文华酒店

1. 出租车：车程预计 35 分钟，费用约 50 元。

2. 公交：约 1 小时 50 分钟。

哈尔滨西站→步行 350 米到达哈西长途客运站公交站→乘坐新区 6 号线公交车→万达文华酒店下车→步行 100 米抵达万达文华酒店。

Venue Transportation and Surroundings

Harbin Wanda Vista Hotel is located in the Wanda Cultural Tourism City, Songbei District, Harbin, just steps away from the Ice and Snow Paradise, Wanda Mall, Theme Park, and Movie Park.

Address: No. 87, Shimao Avenue, Songbei District, Harbin.

How to Arrive:

Location	Straight-line Distance (Approx.)
Harbin Taiping International Airport	38 km
Harbin West Railway Station	35 km

●From Harbin Taiping International Airport to Harbin Wanda Vista Hotel

1.Taxi: Approximately 40 minutes, fare around ¥95.

2.Public Bus: Approximately 1 hour 50 minutes.

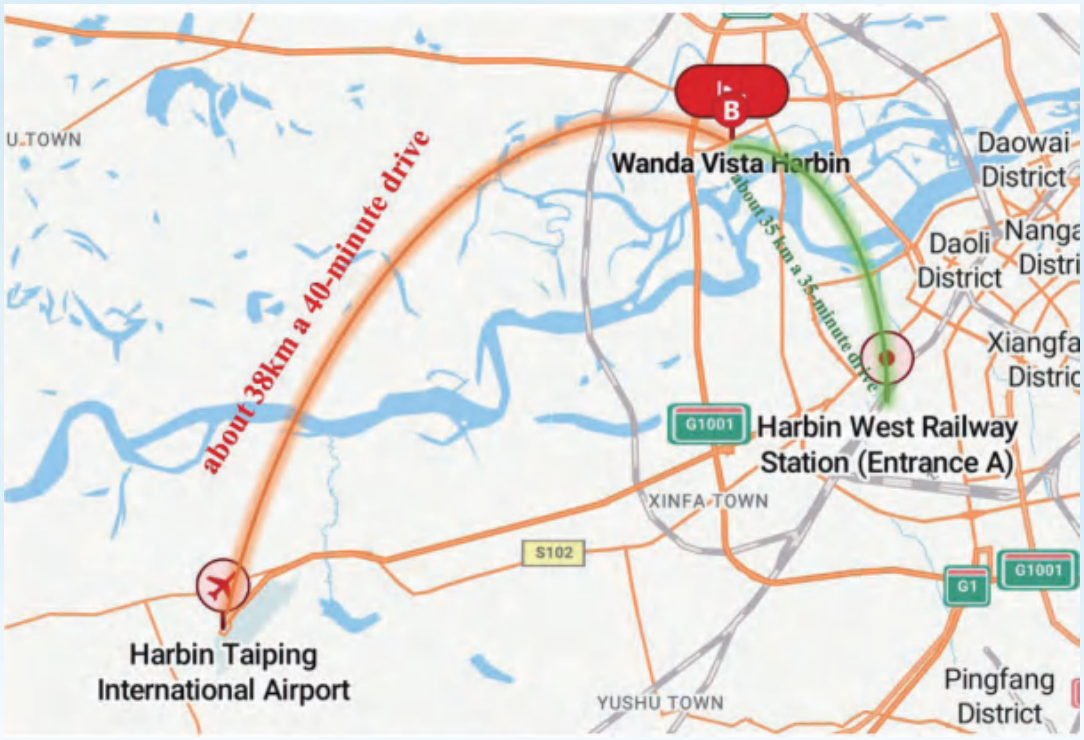
Harbin Taiping International Airport → Airport Shuttle (Rongchuang Line) → Rongchuang City Station → Walk 440 m to Hongyuan Street → Take Bus 396 → Wanda Snow Paradise Station → Walk 340 m to Wanda Vista Hotel.

●From Harbin West Railway Station to Harbin Wanda Vista Hotel

1.Taxi: Approximately 35 minutes, fare around ¥50.

2.Public Bus: Approximately 1 hour 50 minutes.

Harbin West Railway Station → Walk 350 m to West Long-Distance Bus Station → Take New District Bus Line 6 → Wanda Vista Hotel Station → Walk 100 m to Wanda Vista Hotel.

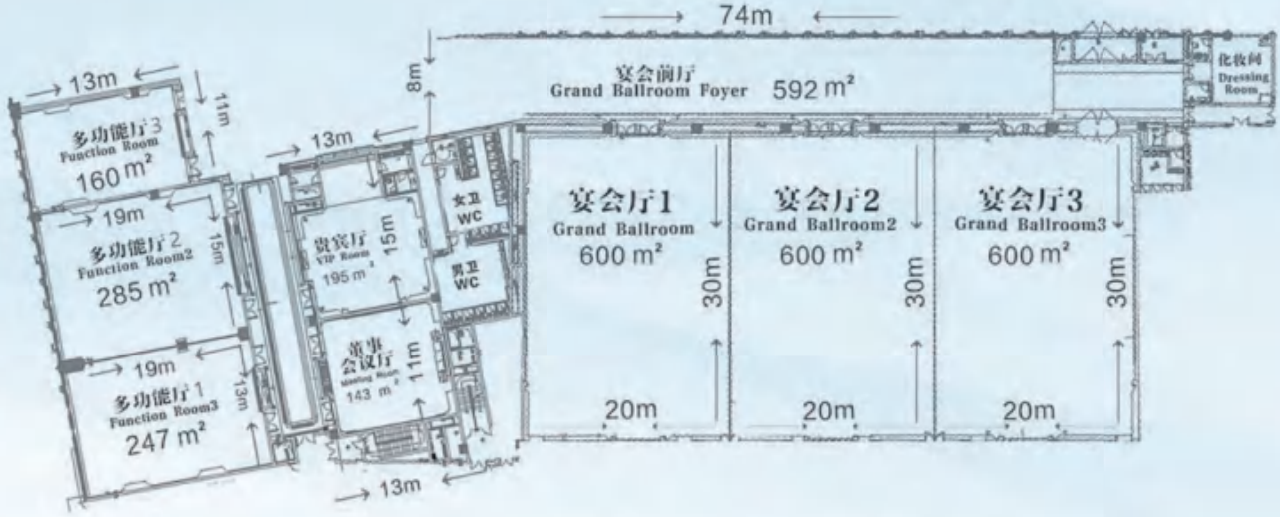


会场环境
Conference Environment

宴会厅 2 & 3
Grand Ballroom 2 & 3

多功能 1 厅、2 厅、3 厅
Function Room 1, 2, 3

会场平面图 Floor Plan



Harbin Institute of Technology

Harbin Institute of Technology (HIT) was established in 1920 in Harbin, Heilongjiang, China. In 1954, HIT became one of China's first six leading universities.

Presently HIT is a member of China's top nine University Union (C9). It is a National Key University with science and engineering as its core and has developed with management, liberal arts, economy, law and other disciplines. Renowned as "the cradle of engineers," the university has many firsts. HIT established the first School of Astronautics in China. It was the first Chinese university to independently develop and enter small satellites (smallsats and microsats) into the moon's orbit. HIT was also the first to achieve satellite ground laser communication link communications. Additionally, HIT developed the first computer to play chess and talk with people and it is the first university to produce arc- and spot welding robots. HIT was the first university to reveal the virulent factor of the HIV virus. It was also the first university to achieve a major breakthrough in supporting structure development for the largest radio telescopes. The first human–machine in orbit maintenance experiments on a space operator was also developed by HIT.

At HIT, there are 23 schools, 86 undergraduate programs, 9 National Key Disciplines, 12 National Key Labs, and 38 members of the prestigious Chinese Academy of Sciences and Chinese Academy of Engineering. Eleven disciplines of HIT are ranked among the top 1% on the Essential Science Indicators (ESI) lists. The material science and computer science of HIT in particular are ranked among the top 1‰, and engineering discipline ranked among the top 1‰. In 2020, HIT ranked 6th on the list of the best global universities for engineering announced by the U.S. News & World Report.

Since its beginning, HIT has always had a strong international environment. Now HIT has signed academic cooperation agreements with 278 universities in 39 countries. These collaborations include student and faculty exchange programs, joint academic conferences, and scientific research cooperation. Together with Weihai campus and Shenzhen campus, HIT forms the pattern of "One University, Three Campuses." HIT is steadily moving towards the goal of becoming a world-class university.

School of Astronautics, Harbin Institute of Technology

In June 1987, with the approval of the Ministry of Aerospace Industry of the PRC, Harbin Institute of Technology (HIT) established China's first school that focused on cultivating advanced aerospace talents and engaged in high-tech researches in aerospace, namely the School of Aerospace.

The school has 13 departments, research institutes (centers), 5 undergraduate majors, and 5 first-level disciplines: Control Science and Engineering, Aeronautical and Astronautical Science and Technology, Mechanics, Electronics Science and Technology, and Optical Engineering.

At present, the school is taking advantage of its strong strength, high starting point and rapid development, and striving to become one of the first-class aerospace schools around the world as soon as possible.

Beijing Institute of Control Engineering

Founded on October 11, 1956, Beijing Institute of Control Engineering (BICE) is one of the earliest institutes in China dedicated to the research and development of spacecraft. As a founding member of the Chinese Association of Automation (CAA), BICE played a key role in CAA's admission as a founding member of the International Federation of Automatic Control (IFAC).

BICE mainly engages in the design and development of spacecraft guidance, navigation and control system (GNC), attitude and orbit control system (AOCS), propulsion system and associated equipment, with a worldwide reputation as the pioneer and leader in China's spacecraft control and propulsion technology.

BICE has participated in R&D of most Chinese spacecraft, making significant technical contributions, particularly in manned spaceflight and lunar/deep-space exploration missions, and related projects encompassing communications, navigation, and remote sensing satellites, as well as space science satellites. It has become the top runner in spacecraft attitude and orbit control technology, space propulsion technology, space rendezvous and docking technology, spacecraft re-entry and return control technology, extraterrestrial body soft landing technology and many other fields. BICE has an outstanding team of experts, engineers and technicians, more than 70% of whom have doctorate or master's degrees. BlCE is rooted in cutting-edge innovations. BlCE has won more than 60 awards of the State Technological Innovation Awards and National Awards for Progress in Science and Technology, acquired 1,800 patents of invention, and mastered a number of core technologies with independent intellectual property rights.

BICE always adheres to the Going Global strategy by enhancing international exchanges and cooperation, and actively explores the international market for aerospace products. Going forward, BICE will always keep pace with the times and the world, and contribute to the sound development and utilization of space resource, the protection of space environment and the promotion of space industry for the benefit of all mankind.

Plenary talks

Plenary talk 1

August 3, 9:00-9:45, Grand Ballroom 2 & 3

Speaker: Klaus Schilling, Center for Telematics, Wuerzburg, Germany
Title: The Future in Space: Smarter, Smaller and More Cooperative Satellites

Abstract: A paradigm change in spacecraft engineering can currently be observed: traditional multi-functional, large spacecraft are complemented by robust systems of networked, cooperating, distributed very small satellites. In particular in Earth observation innovative technologies are emerging, based on self-organizing sensor networks in orbit. Similar trends for distributed systems emerged in information systems since 1970, where the large mainframe computers were complemented by today's smart phones, networked via Internet to form the basis for cloud data distribution. In addition, modern miniaturization technologies support production of robust, cost-efficient small satellites with increasing performance in terms of their control capabilities. The deficits of miniaturization are to be compensated by advanced control, redundancy management and operations software. Those principles for future multi-satellite systems will be illustrated by examples of current formations of self-organizing nano-satellites as cooperating sensor networks in space taking advantage of multi-perspective views, in particular for application fields in Earth observation. Here the specific example mission CloudCT, composed of 10 small satellites coordinated by networked control to characterize the interior of clouds by computed tomography methods will be discussed in more detail.

Prof. Klaus Schilling had in space industry responsibility in Earth observation and interplanetary satellites (such as HUYGENS to the Saturnian moon Titan and ROSETTA for exploration of comets), before he was appointed professor and chair for Robotics and Telematics at University Würzburg. In parallel he is president of the research company "Center for Telematics (ZfT)". His team built the first German pico-satellite UWE-1, launched 2005 to optimize Internet in space. He published more than 400 papers and received several awards, including the Walter-Reis-Award for Robotic Innovations 2008 (for research in mobile robotics) and 2012 (for medical robotics), an ERC Advanced Grant 2012 for research on control of networked distributed satellite systems and an ERC Synergy Grant 2018 for "CloudCT" to improve climate models by observations from a formation of 10 small satellites. He was awarded with the Eugen-Sänger-Medal 2021, the Global AACII Award in 2022, the Malina-medal 2023 of the International Astronautical Federation IAF for his contributions to technology progress in small satellite area. He is full member of the International Academy of Astronautics and was Consulting Professor at Stanford University 2002-2006.

Plenary talk 2

August 3, 10:15-11:00, Grand Ballroom 2 & 3

Speaker: Olga Leonardovna Starinova, Samara National Research University, Russia
Title: Optimal Solar Sail Control for Launching into Artificial Periodic Orbits near L2 of Earth-Moon System

Abstract: Over the past decade, the Moon exploration, especially its far side and polar regions, will become a priority of space programs. Communication and navigation systems are necessary for the successful its implementation. Natural periodic orbits around the L2 point of the Earth-Moon or Sun-Earth system are often chosen for the operation space system. The talk gives the method of forming solar sail control for flights between periodic orbits lying near the L2 liberation point of the Earth-Moon system. Optimal flights to artificial resonant orbits of the second order are considered in terms of minimal flight duration in the three-body problem frame. Effective algorithms that allow obtaining the required control programs are described and the obtained results dependencies on the model parameters are analyzed.

Prof. Olga Leonardovna Starinova is a member of the International Academy of Navigation and Motion Control, a member of the Russian Academy of Astronautics, a member of the French Academy of Aeronautics and Astronautics, and a consultant of the Russian Academy of Engineering. She is an expert in dynamics, ballistics and motion control of low-thrust spacecraft. The here research areas are a flight dynamics and motion control of electric propulsion spacecraft or solar sail spacecraft in gravitational fields of complex configuration, development of numerical methods for optimizing control programs for low-thrust spacecraft. Author of more than 250 papers on problems of optimal control of spacecraft, ballistic design, mathematical modeling. She is the author and co-author of monographs: Methods for solving variational problems of low-thrust space flight mechanics, Calculation of interplanetary flights of low-thrust spacecraft, Solar sailing terminology: Russian-English-Chinese Guide Textbook (in Russian, Chinese, English). She has 18 patents developed by her with a team of software complexes.

She works as the head of the Department of Flight Dynamics and Control Systems and the chief researcher of the research Laboratory Dynamics and Motion Control of Aircraft of Samara National Research University, Russia. She was awarded Medal of Alexander Humboldt of the European Academy of Natural Science, Medal of Sergey Pavlovich Korolev of the Cosmonautics Federation of Russia, Medal of Carl Friedrich Gauss of the European Academy of Natural Science, Badge Honored Worker in the Youth Policy Field of the Science and Education Ministry of Russian Federation.

Plenary talk 3 August 3, 11:00-11:45, Grand Ballroom 2 & 3

Speaker: Yongchun Xie, Beijing Institute of Control Engineering, China
Title: On Key Technologies for Spacecraft Intelligent Autonomous Control and Application Prospects

Abstract: With the surge in spacecraft numbers, increasing complexity of mission types, and expansion of operational scopes, there is a pressing need to enhance the functional performance of spacecraft control systems, strengthen autonomy and the ability to cope with significant uncertainties. Consequently, intelligent autonomous control for spacecraft has emerged as a primary technical approach to address these challenges. Drawing on engineering experience in rendezvous and docking (RVD) from China's manned space project and lunar exploration missions, the report systematically examines critical theoretical and technological challenges, innovative solutions, and engineering implementation effects of space intelligent autonomous control in practical engineering applications, across three technical dimensions - autonomous perception, hierarchical planning, and precise control.

First, focusing on core technical challenges of autonomous RVD, the report elaborates in depth on three technological breakthroughs: 1) an intelligent autonomous GNC integrated architecture, 2) hierarchical planning and multi-variable coordinated guidance, 3) golden-section phase-plane adaptive control. Second, concerning application of learning-based artificial intelligence (AI) methods in space operations, the research delves into three innovation directions: 1) intelligent perception of spatial targets, 2) intelligent planning for complex missions, 3) stability control for precise operations. From the perspective of high-level mission planning, the report specially introduces a complex flight mission planning methodology based on anchor point setting, and systematically elaborates on the technical architecture for spacecraft intelligent autonomous control based on relative motion dynamics. Finally, building upon the prevailing technology trend, the report provides forward-looking prospects on future development directions for space intelligent autonomous control technologies, including the deep integration of AI and spacecraft control, advancements in autonomous decision-making and other frontiers.

This report not only summarizes China's pivotal breakthroughs in space RVD technology, but also presents a referential technological roadmap for subsequent major space projects such as manned lunar landing and deep-space exploration.

Prof. Yongchun Xie is director of Science & Technology Committee and chief technologist in RVD field at BICE, senior chief professor of China Academy of Space Technology, director of Tianjin Key Laboratory on Microgravity & Low-gravity Environment Simulation Technology, academic and technical leader of China Aerospace Science and Technology Corporation. Her academic positions include fellow and executive council member of Chinese Association of Automation, corresponding member of International Academy of Astronautics, a vice chair of IFAC TC on Aerospace, and editor-in-chief of Aerospace Control and Application.

She has pioneered long-term research in spacecraft intelligent autonomous control theories, established and led China’s space RVD control innovation team, systematically achieved breakthroughs spanning automated, manual and fully autonomous fast RVD. She innovatively proposed Multi-Mode Autonomous RVD Precise Control Theory, constructing a holistic technical architecture that was successfully implemented in 36 RVD missions - including China’s Shenzhou manned spacecraft, Tianzhou cargo vehicles and Chang’e lunar explorers - with the 2-hour fully autonomous ultra-fast RVD creating a new world record in TZ-5 mission. She was awarded 1 Second Prize of China’s National Technological Invention Award, 7 First Prizes of Provincial/Ministerial-Level Science and Technology. She published 4 monographs, 1 technical compendium, 169 high-impact papers, and obtained 76 authorized invention patents. She was awarded CASC Outstanding Contribution Award, Guan Zhaozhi Award, First Prize of Yang Jiachi Science and Technology Award, WIPO Best Female Inventor Award, granted China’s Special Government Allowances of the State Council.

Plenary talk 4 August 5, 15:30-16:15, Grand Ballroom 2 & 3

Speaker: Radhakant Padhi, Indian Institute of Science, Bangalore, India
Title: Optimal Guidance in Soft-Landing of Chandrayaan-3

Abstract: High-precision autonomous soft-landing is increasingly becoming an essential requirement for various inter-planetary missions and also missions of unmanned aerial vehicles. A good soft-landing algorithm must fulfill various conditions, such as high terminal position, velocity and acceleration accuracy, continuity between phases, recovery from path perturbations, and prevention of altitude excursion. Moreover, autonomous soft-landing in space missions needs to be carried out with the limited capability of onboard processors, thereby necessitating a closed-form expression of the guidance law. A powerful Jerk-minimizing optimal guidance incorporating all these features, developed and published by Prof. Padhi and his research team, will be discussed in this talk, a milder version of which was used in the Chandrayaan-3 mission due to system limitations. The talk will also include the drone soft-landing experiments carried out by Prof. Padhi's team in the outdoor environment for confidence building prior to the Chandrayaan-3 mission. For completeness, this talk will also include some of the lessons learnt from the unsuccessful attempt of Chandrayaan-2 and the improvements carried out subsequently that led to the success of the Chandrayaan-3 mission.

Prof. Radhakant Padhi, a Ph.D. from the Missouri University of Science and Technology, Rolla, USA, is currently the HAL Chair Professor at the Department of Aerospace engineering in the Indian Institute of Science, Bangalore; and also an Associate Faculty at its Centre for Cyber-Physical Systems. He is a Fellow of Indian National Academy of Engineering (INAE), Astronautical Society of India (ASI), Aeronautical Society of India (AeSI), Institution of Electronics and Telecommunication Engineers (IETE), and Institute of Engineers (India). He is an Associate Fellow of AIAA and a Senior Member of Institute of IEEE. He is the Director of Operations of the Automatic Control and Dynamic Optimization Society, which is the national member organization of the International Federation of Automatic Control (IFAC) in India. He is an Associate Editor of Unmanned Systems journal, and has been an associated editor of two more journals in the past in the control and automation field.

Prof. Padhi's research interest is in optimal and nonlinear control synthesis algorithms and their applications to challenging practical problems in aerospace, biomedical and mechanical engineering. He has co-authored 93 journal papers and 200 conference papers, and also a book on Satellite Formation Flying (2021). Three more books are going to be published soon, on Intelligent Adaptive Control with System Constraints, on Applied Optimal Control and State Estimation, and on Flight Mechanics and Control. He is also a co-author of the motivational book for young minds The Gap Year Advantage: Efforts are in your hands, Results are not, published recently in 2025.

Prof. Padhi is a member of technical review committees for several missions of Indian Space Research Organisation (ISRO) and Defence R&D Organisation of India. Recently, Prof. Padhi has floated two deep-tech start-ups through which he intends to utilize his research output for the benefit of the society.

Plenary talk 5 August 5, 16:15-17:00, Grand Ballroom 2 & 3

Speaker: Lixian Zhang, Harbin Institute of Technology, China
Title: In-Cabin Robots for Space Stations: Research Status and Key Technologies

Abstract: The in-cabin robots for space stations, including humanoid robots, crawling robots, and flying robots, are regarded as pivotal tools for advancing space station automation. Since 1998, world-leading space agencies, such as NASA and RKA, have spearheaded the development of in-cabin robots for space stations, with multiple prototypes having successfully undergone on-orbit experimental verification aboard the International Space Station. Compared to Earth-based robots, in-cabin robots working in space stations face technical challenges in terms of highly-integrated configuration design, microgravity motion control, and safety-critic human-robot interaction, leading to the emergence of divergent configuration schemes and technical solutions worldwide. This report will provide a systematic analysis of in-cabin robots for space stations, covering their research milestones and key technologies, and projecting their future development in in-cabin environmental monitoring, astronaut-robotcollaboration, and on-orbit swarm operations.

Prof. Lixian Zhang received the Ph.D. degree in control science and engineering from Harbin Institute of Technology (HIT), Harbin, China, in 2006. From January 2007 to September 2008, he was a Postdoctoral Fellow in the Department of Mechanical Engineering at the Ecole Polytechnique de Montreal, Canada. He was a Visiting Professor at the Process Systems Engineering Laboratory, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA, from February 2012 to March 2013. Since January 2009, he has been with the Harbin Institute of Technology, where he is currently a Full Professor and the Vice Dean of the Institute for Artificial Intelligence.

Prof. Zhang's research interests include advanced/intelligent control theory and applications in specialized robots and spacecraft. He has co-authored over 200 high-impact papers in journals including Automatica, IEEE TAC/TAES/RAL, and AIAA JGCD. His research works have been awarded with 2023 IEEE RAL Best Paper Award, and recognized as One of 100 Most Influential Papers at China in 2013. He has led over 30 scientific research projects, and developed a series of robotic platforms that applied in national major in orbit engineering missions; reported by CCTV's News Broadcast, Live News, and other CCTV programs.

Prof. Zhang currently serves as Senior Editor for IEEE Control Systems Letters, and previously served as Associate Editor for IEEE Transactions on Automatic Control and IEEE Transactions on Cybernetics. He is a winner of the National Science Fund for Distinguished Young Scholars, and has been honored with "Qian Xuesen Outstanding Contribution Award". He received the awards of "National Natural Science Award" (second class) and "Heilongjiang Natural Science Award" (first class). He has been listed as a Clarivate Analytics Highly Cited Researcher from 2014 to 2023. He is a Fellow of IEEE and IET.

Semi-plenary talks

Semi-plenary talk 1
August 4, 8:30-9:00 Grand Ballroom 2
Speaker: Jinjun Shan, York University, Canada
Title: Dynamics and Control of Smart Structures for Space Applications

Abstract: Smart materials are materials that are capable of changing their properties in a controlled fashion, typically based on a supplied input. These types of materials can be incorporated into structures to create smart, or intelligent, structures capable of sensing and reacting to changes in their operating environment. A sensor is used to monitor the system and its output is connected to a control unit which will generate a response to the sensor signal, which is then applied to the actuator to generate a desired system behaviour. There are many forms of smart materials including shape memory alloys, piezoelectrics, magnetorheological and electrorheological fluids, and magenetostrictives and electrostrictives. The possibility to change a materials property in a controlled fashion is fascinating and has found applications in a diverse number of fields including positioning, shape and vibration control, and fault detection and mitigation. Within the space sector, as more is demanded of systems in increasingly complex applications in harsh environments, smart materials present themselves as one of the most viable solutions to these engineering problems. In this talk, Prof. Shan will provide a summary of his research on dynamics modeling and control system design of smart materials and structures, as well as their applications in active vibration control of flexible systems, active flatness control of space membrane structures, high-precision motion control, and high-spatial space spectrometer.

Prof. Jinjun Shan is an internationally recognized expert in the areas of dynamics, control and navigation. He is a Full Professor of Space Engineering at the Department of Earth and Space Science and Engineering, York University. Prof. Shan received his Ph.D. degree from Harbin Institute of Technology, China, in 2002. His research progress is demonstrated through over 230 peer-reviewed journal and conference publications and 2 issued patents. Prof. Shan's accomplishments in research and engineering education have seen him recognized with prestigious recognitions such as the Fellow of Canadian Academy of Engineering (CAE), the Fellow of Engineering Institute of Canada (EIC), the Fellow of American Astronautical Society (AAS), and a member of European Academy of Sciences and Arts (EASA). He serves the profession as the Associate Editor for several field-leading journals. He is the founding director of Spacecraft Dynamics Control and Navigation Laboratory (SDCNLab) at York University.

Semi-plenary talk 2
August 4, 9:00-9:30 Grand Ballroom 2
Speaker: Paolo Castaldi, University of Bologna, Italy
Title: Aerospace Control Education

Abstract: This plenary talk presents a comprehensive overview of the current landscape of control education for aerospace engineering, drawing on the key outcomes from the first two IFAC Workshops on Aerospace Control Education, held in 2021 and 2024. The 2021 edition was organized by Prof. Marco Lovera (NOC Chair) and Prof. Paolo Castaldi (Co-NOC), while the 2024 edition was chaired by Prof. Paolo Castaldi. Sponsored by IFAC Technical Committee 7.3 (Aerospace) and co-sponsored by TC 9.4 (Control Education), these events attracted significant international engagement and featured a total of 70 accepted papers, underscoring the growing importance and visibility of this emerging educational domain.
For the first time in the literature, this plenary talk provides a structured and critical survey of the approaches, tools, and pedagogical practices used in teaching control systems within aerospace engineering curricula. Synthesising insights from both workshops and recent scholarly work, the talk is organised around the following key thematic areas:
- **Tools, Testbeds, and Laboratories:** Presentations showcased a broad array of physical and virtual environments that enhance experiential learning in aerospace control, reinforcing theory through hands-on implementation.
- **AI and Digital Technologies:** The integration of artificial intelligence, machine learning, and digital twin technologies into aerospace control education is rapidly transforming course content, delivery methods, and student engagement.
- **Emerging Technologies and Simulation Tools:** The use of virtual/augmented reality (VR/AR), simulators and real-time platforms is expanding the boundaries of traditional control education and improving accessibility.
- **Drones as Educational Platforms:** UAVs and quadrotors have become increasingly popular for teaching real-time control, navigation, and system integration, providing a low-cost, high-impact platform for project-based learning.
- **Project-Based Learning (PBL):** PBL strategies were widely reported as effective in promoting deep learning, teamwork, and problem-solving skills among aerospace engineering students.
- **Innovative Pedagogies and Learning Experiences:** Case studies presented diverse and innovative instructional approaches, including curriculum redesigns, classrooms organization, industrial contributions and novel assessment frameworks tailored specifically to aerospace control topics.
Key takeaways of this plenary lecture for the aerospace control education community include: Broad recognition of the value of interdisciplinary, hands-on, and experiential learning approaches. Clear trends toward the integration of cutting-edge technologies into aerospace control instruction. A shared call for increased international collaboration, open educational resources, and knowledge exchange. The formation of a growing global network committed to advancing control education in the aerospace domain. By the conclusion of the talk, participants will have gained a rich perspective on current best practices, innovative methods, and future directions in control education for aerospace engineering, informing curriculum development and instructional strategies across undergraduate, graduate, and professional training programs.

Prof. Paolo Castaldi received the Master Degree cum laude in Electronic Engineering and the Ph.D in System Engineering from UNIBO. He is currently an Associate Professor at Department of Electric, Electronic and Information Engineering of the University of Bologna “Guglielmo Marconi” and has the Italian Scientific Habilitation as Full Professor. He has been a plenary speaker for two congresses and NOC and IPC of several congresses. In 2024 he was the NOC of the second edition of the IFAC workshop on Aerospace Control Education. He has been a coordinator and member of several research and industrial projects involving experimental aircraft. He is chair of the IFAC TC 7.3 on Aerospace (previously vice-chair for Education), Member of IEEE TC on Aerospace, Chair of IFAC Task Force on Coordination of Educational Activities with IEEE and Other Organisations and member of IFAC TC 9.4 on Education. Since 2015, he is Associated Editor of Control Engineering, Practice, Journal of Franklin Institute, Aerospace Engineering Journal (Wiley) and since 2022 of Frontiers in Control Engineering. He was awarded with prizes issued by IFAC, Mathworks and KK-Electronics in 2012 and 2014 at the international competition on fault detection and fault tolerant control of wind turbine. He published in 2025 on Nature. He has the license as Private Pilot (PPL) and for piloting drones till 24 kg and has been coordinator of several Permit to Fly procedures. His research interests include: Aerospace Control Education; Intelligent Control for Aircraft, Spacecraft and Marine Vehicles; Fault Diagnosis and Fault Tolerant Control, Nonlinear Geometric Approach Theory, Fractional System Control, Adaptive Filtering, Neural Network, and System Identification.
These techniques have been applied to UAVs, experimental FW aircraft, marine vehicle industrial processes, power plants and renewable energy conversion systems.

Semi-plenary talk 3
August 4, 9:30-10:00 Grand Ballroom 2
Speaker: Weidong Zhang, Shanghai Jiao Tong University, China
Title: Key Technologies of UAV-USV Cooperation System for Maritime Search and Rescue

Abstract: The report, set against the backdrop of maritime search and rescue, introduces an unmanned search and rescue system composed of drones and unmanned boats. This system leverages the advantages of drones' wide search range and long communication distance, as well as the long endurance of unmanned boats, to establish an UAV-USV search and rescue system that responds quickly, is cost-effective, and poses no risk of casualties. The report outlines the current development status, discusses key technologies such as landmark recognition, pose control, and cooperative decision-making, and presents the verification process of drone landing technology based on visual navigation in recent years.

Prof. Weidong Zhang received his BS, MS, and PhD degrees from Zhejiang University, China, in 1990, 1993, and 1996, respectively, and then worked as a Postdoctoral Fellow at Shanghai Jiaotong University. He joined Shanghai Jiaotong University in 1998 as an Associate Professor and has been a Full Professor since 1999. From 2003 to 2004 he worked at the University of Stuttgart, Germany, as an Alexander von Humboldt Fellow. From 2007 to 2008 he worked at Princeton University, USA, as a Visiting Professor. From 2013 to 2017 he serviced as Deputy Dean of the Department of Automation, Shanghai Jiaotong University. He serving as a part-time professor at Hainan University from 2021. He is currently Chair Professor of Shanghai Jiaotong University, Director of the Engineering Research Center of Marine Automation, Shanghai Municipal Education Commission, China. His research interests include control theory, machine learning theory, and their applications in industry and robots. He is the author of more than 300 papers and 2 books. His papers have been cited for more than 23k times in Google, and he has been recognized as Elsevier Most Cited Researcher and Highly Ranked Scholar- Lifetime of ScholarGPS.

航天控制论坛

8 月 4 日，8:30-9:00 宴会厅 3

报告人：段海滨教授 北京航空航天大学

题　目：鸟群智能激发汇聚启发的无人机集群自主控制

摘要：大自然是人类社会创造的丰富灵感源泉，鸟群杂乱无章飞行实则井然有序。本报告研究分析了自然界中鸽群、燕群、鹰群等典型鸟类的集群飞行机理、结合鸟群飞行实验多场景数据探究了鸟群内在激发汇聚规律，建立了鸟群激发汇聚与控制论中正负反馈机制的映射关系，并将其应用于无人机集群自主飞行控制，以"换道"提升无人机集群的新质能力。

段海滨，北京航空航天大学长江学者特聘教授，"万人计划"- 科技创新领军人才、国家杰出青年科学基金获得者。主持国家自然基金重大研究计划重点项目、国家自然科学基金原创探索计划重点项目、国家自然科学基金企业创新联合基金重点项目、国家自然科学基金重点项目等课题。发表 SCI 论文 90 余篇，专著 4 部，发明专利 41 项，2020-2024 年爱思唯尔中国高被引学者，获省部级一等奖 5 项，获中国青年科技奖、全国优秀科技工作者、中国青年五四奖章、冯如航空科技精英奖。《Guidance, Navigation and Control》主编，《自动化学报》、《工程科学学报》副主编，《中国科学：信息科学》、《中国科学：技术科学》等编委，中国自动化学会无人飞行器自主控制专业委员会主任、中国航空学会制导导航与控制分会主任，IFAC TC7.4 委员，第十二届、第十三届全国青联常委兼科学技术界别副主任委员。主要研究方向：无人机集群仿生自主飞行控制。

航天控制论坛

8 月 4 日，9:00-9:30 宴会厅 3

报告人：陈立群教授 哈尔滨工业大学（深圳）

题　目：基于全驱系统方法的无退绕航天器姿态控制

摘要：姿态控制对于航天器执行空间任务至关重要，航天器结构日趋复杂对控制设计方法提出新的挑战。全驱系统理论提出一种全新的控制理论框架。在此总结我们基于全驱系统方法进行无退绕航天器姿态控制的若干进展。先简要概述了全驱系统方法。然后基于四元数表示的动力学模型，用全驱系统方法研究刚性航天器和带柔性附件或充液腔的复杂航天器的姿态控制，分析表明所设计的控制器自然具有无退绕特性。最后比较了基于全驱系统方法和基于状态空间方法所设计的两类姿态控制器。

陈立群，哈尔滨工业大学深圳校区理学院力学学科教授，基础科学研究中心"高阶全驱系统理论与航天器控制技术"骨干成员。研究方向包括减振和隔振的非线性设计、振动能量采集、轴向运动结构振动、航天器姿态动力学和控制，研究工作曾受国家杰出青年科学基金和国家自然科学基金重点项目等资助。主要荣誉和表彰有全国优秀博士后、教育部国家级人才、全国模范教师、国务院政府特殊津贴、国家自然科学二等奖、国家级教学名师和全国先进工作者。

航天控制论坛

8 月 4 日，9:30-10:00 宴会厅 3

报告人：张永合研究员 中国科学院微小卫星创新研究院

题　目：空间科学极限探测任务中的控制技术及前沿进展

摘要：产生于早期宇宙的剧变、暂现天体是国际天文领域的重要观测目标与研究前沿。此类天文事件释放出电磁辐射，或引起引力波现象，但其随机出现、转瞬即逝，可探测信号极为微弱，需要突破空间极限探测技术。针对宇宙暂现源电磁信号多波段探测及在轨后随观测，需要突破具有“大范围巡天、高自主捕获、高精稳凝视、高精度测量”的航天器平台控制技术。2024 年，我国相继成功发射了天关 - 爱因斯坦卫星 (EP)、中法天文卫星 (SVOM)，对空间伽马暴等暂现源进行多波段发现、定位与探测，取得多项高价值科学观测成果。本报告对该两型卫星的包括高稳定度指向控制、自主捕获定位、敏捷机动巡天在内的多项控制技术与科学探测结果进行介绍。对于空间引力波探测，为实现中低频段极微弱引力波信号的精密探测与定位，需要发展超高精度多参考质量无拖曳控制、高精度光链路捕获跟瞄、超大尺度编队等控制技术。我国于 2019 年发射空间引力波探测技术验证卫星“太极一号”，成功实现我国首次无拖曳控制空间飞行实验。本报告也将介绍空间引力波探测中用到的多项关键控制技术与平台技术的研究进展。

张永合，中国科学院大学（UCAS）博士，现任中国科学院微小卫星创新研究院（IAMCAS）副院长，中国科学院卫星数字化技术重点实验室主任。长期从事空间科学探测卫星的系统设计、关键技术攻关，聚焦于先进导航制导控制（GNC）等技术的研究与工程实现。近年来，担任天关 - 爱因斯坦卫星（EP）总设计师，中法天文卫星（SVOM）卫星总指挥、系统工程师，担任国家重点研发计划“空间引力波探测多参考质量无拖曳控制方法与技术研究项目”首席科学家。

Oral Presentations

Parallel Session 1

Parallel Session 1	Aug 3, Sunday, 14:00-18:00
Oral Session 1	Function Room 1

Sun-R.01 Swarm Intelligence in Aerospace Dynamics and Control

Chair: Shengping Gong — Beihang University
Chair: Yanning Guo — Harbin Institute of Technology
Chair: Zhaohui Dang — Northwestern Polytechnical University

●Oral-01 14:00-14:15

[0193] Model Predictive Local Linear Controller with Adaptive Constraint Handling

Yubin Peng — Beihang University
Donghe Chen — Beihang University
Shengping Gong — Beihang University
Lin Cheng — Beihang University

●Oral-02 14:15-14:30

[0190] An Enhanced Adviser-Actor-Critic Framework for High-Precision Reinforcement Learning Control

Jiaxuan Yue — Beihang University
Donghe Chen — Beihang University
Lin Cheng — Beihang University
Shengping Gong — Beihang University

●Oral-03 14:30-14:45

[0256] An Optimization Method of Triangular Formation for Space Gravitational Wave Detection in Three-Body Dynamics

Yuhang Zhang — Northwestern Polytechnical University
Bohan Jiao — Northwestern Polytechnical University
Zhaohui Dang — Northwestern Polytechnical University

●Oral-04 14:45-15:00

[0484] A Large Language Model-Based Approach to Spacecraft Formation Mission Planning

Yuhang Zhang — Northwestern Polytechnical University
Bohan Jiao — Northwestern Polytechnical University
Zhaohui Dang — Northwestern Polytechnical University

●Oral-05 15:00-15:15

[0463] Learning-Based Orbital Pursuit-Evasion Games Near Earth-Moon L1 Point

Kangjun Jia — Northwestern Polytechnical University
Zhaohui Dang — Northwestern Polytechnical University

●Oral-06 15:15-15:30

[0508] Impulsive Maneuver Detection of Cislunar Space Objects Based on Convolutional Neural Network

Wenxuan Zhang — Northwestern Polytechnical University
Zhaohui Dang — Northwestern Polytechnical University

●Oral-07 15:30-15:45

[0241] Spacecraft Formation Flying with Connectivity Maintenance under Directed Spanning Tree

Tianhang Song — Xi'an University of Technology
Xianghong Xue — Xi'an University of Technology
Wenhao Huang — Xi'an University of Technology
Youmin Zhang — Concordia University
Lingxia Mu — Xi'an University of Technology

●Oral-08 16:00-16:15

[0496] Learning to Win: DDPG vs. Differential Games in Orbital Pursuit-Evasion

Sihan Xu — Northwestern Polytechnical University
Zhaoyang Liu — Northwestern Polytechnical University
Zhaohui Dang — Northwestern Polytechnical University

●Oral-09 16:15-16:30

[0067] Deep Neural Network-Based Transfer Time Estimation for Solar Sail Missions

Jiajun Zhu — Nanjing University of Aeronautics and Astronautics
Hongwei Yang — Nanjing University of Aeronautics and Astronautics
Haiyang Li — Deep Space Exploration Laboratory

●Oral-10 16:30-16:45

[0332] Dynamic Edge-triggered Based Distributed Formation-containment Control for Heterogeneous Multi-agent Systems

Mingliang Liu — Harbin Institute of Technology
Meize Qin — Shanghai Institute of Satellite Engineering
Guangtao Ran — Harbin Institute of Technology
Yanning Guo — Harbin Institute of Technology

●Oral-11 16:45-17:00

[0146] Multi-Target Rapid Mission Planning Via Lambert Transfer

Hang Xu — Shanghai Institute of Aerospace System Engineering
Xinglong Li — Shanghai Institute of Aerospace System Engineering
Bin Song — Shanghai Institute of Aerospace System Engineering
Yanning Guo — Harbin Institute of Technology

●Oral-12 17:00-17:15

[0353] Analysis of Liquid Slosh by Physical Information Neural Network

Jiawei Huo — Harbin Institute of Technology
Chengfei Yue — Harbin Institute of Technology, Shenzhen
Tianshu Wang — Tsinghua University
Xibin Cao — Harbin Institute of Technology

●Oral-13 17:15-17:30

[0203] Autonomous Spacecraft Threat Avoidance via Trajectory Prediction and Deep Reinforcement Learning

Weiwei Tu — Harbin Institute of Technology
Yeqing Zhang — Aerospace System Engineering Shanghai
Yuhan Liu — Eindhoven University of Technology
Yanning Guo — Harbin Institute of Technology
Pengyu Wang — Harbin Institute of Technology

Parallel Session 2

Parallel Session 2	Aug 3, Sunday, 14:00-18:00
Oral Session 2	Function Room 2

Sun-R.02 Advanced Navigation, Control and Swarm Coordination for Aircraft Cluster

Chair: Yuhu Wu — Dalian University of Technology
Chair: Shaoming He — Beijing Institute of Technology
Chair: Bo Li — Shanghai Maritime University

●Oral-01 14:00-14:15

[0077] A UAV Trajectory Tracking Algorithm Considering Dynamic Obstacles

Benjie Ma — Beijing Institute of Technology
Jianjian Liang — Beijing Institute of Technology
Ye Xie — Zhejiang Lab
Shaoming He — Beijing Institute of Technology

●Oral-02 14:15-14:30

[0342] Fixed-Time Learning-Based Containment Control for Multi Quadrotor UAVs

Hui Liu — Shanghai Maritime University
Bo Li — Shanghai Maritime University
Xueru Miao — Shanghai Maritime University
Hao Wu — Shanghai Maritime University

●Oral-03 14:30-14:45

[0211] Path Planning for Drones in Obstacle Environments Based on the Chaotic Mapping Kingfisher Optimization Algorithm

Kun Yu — Harbin Institute of Technology
Tianlai Xu — Harbin Institute of Technology
Jingzong Liu — Harbin Institute of Technology

●Oral-04 14:45-15:00

[0362] High angle-of-attack control of fixed-wing UAVs using Proximal Policy Optimization

Xu Li — Sun Yat-sen University
Yabo Hu — Qiyuan Lab
Zhili Hou — Qiyuan Lab
Simeng Huang — Qiyuan Lab
Bin Liang — Tsinghua University

●Oral-05 15:00-15:15

[0490] Unmanned Aerial-Ground Vehicles Path Planning Using Modified Grey Wolf Optimization Algorithm

Junyou Jun — Hangzhou International Innovation Institute, Beihang University
Jie Lin — Beihang University
Huaining Wu — Beihang University

●Oral-06 15:15-15:30

[0006] Adaptive Formation Control of Fixed-Wing Unmanned Aircraft Vehicles: A Distributed Sliding Mode Approach

Hao Xie — Shanghai Aerospace Control Technology Institute
Yang Chen — Shanghai Aerospace Control Technology Institute
Guangshan Chen — Shanghai Aerospace Control Technology Institute
Changchun Zhao — Shanghai Aerospace Control Technology Institute
Zhaoqing Liu — Nanjing University of Posts and Telecommunications

●Oral-07 15:30-15:45

[0489] A Lightweighted Deep Q-Network Algorithm for UAV Path Planning

Zhaohao Bao — Beihang University
Jie Lin — Beihang University
Huaining Wu — Beihang University

●Oral-08 16:00-16:15

[0255] Optimal Fault-Tolerant Formation Control of Multi-UAVs Based on Event-Triggered Control

Tong Mei — Shandong University of Aeronautics
Ruian Wang — Shandong University of Aeronautics
Wenlai Ma — Shandong University of Aeronautics
Wei Hao — Shandong University of Aeronautics

●Oral-09 16:15-16:30

[0426] Computing the Weight Matrix R of Linear Quadratic Control Based on Riccati Equation

Mingzhen Zhang — Harbin Institute of Technology
Jiang Shao — Harbin Institute of Technology
Qingrui Zhou — China Academy of Space Technology
Yongen Zhao — Harbin Institute of Technology

●Oral-10 16:30-16:45

[0550] Finite-time Attitude Control Design of a Coaxial Tilt-Rotor eVTOL under Rotor Fault

Zheng Hou — Dalian University of Technology
Zongyang Lv — University of Alberta
Yuhu Wu — Dalian University of Technology

●Oral-11 16:45-17:00

[0100] Model-Free Adaptive Multivariable Control of Nonlinear Twin-Rotor Dynamics in the Presence of Wind Gust: A Comparison of Different Approaches

Hasan Abbasi Nozari — Babol Noshirvani University of Technology
Shahrzad Hedayati — Rouzbahan Institute of Higher Education
Paolo Castaldi — University of Bologna
Seyed Jalil Sadati — Babol Noshirvani University of Technology

●Oral-12 17:00-17:15

[0435] Continuous Constrained Predictive Control for Quadrotor Trajectory Tracking with Obstacle Avoidance

Somayeh Jamshidi — Sahand University of Technology
Khodaverdian Maria — National Polytechnic University of Armenia
Mehdi Mirzaei — Sahand University of Technology
Paolo Castaldi — University of Bologna
Somayeh Jamshidi — Sahand University of Technology

●Oral-13 17:15-17:30

[0303] Modeling and Compensation of Coupling Disturbance for Aerial Manipulator System Based on Variable Inertia Parameters

Sen Zhang — Soochow University
Mingcong Li — Soochow University
Jun Huang — Soochow University

Yueyuan Zhang Soochow University

●Oral-14 17:30-17:45

[0065] Meta-Learning Observer-Based Control for Air-Breathing Hypersonic Vehicle with Multiple Disturbances

Guan Wang Dalian University of Technology
Di He Dalian University of Technology
Boyu Zeng Dalian University of Technology
Ming Li Dalian University of Technology
Shenghao Wu Dalian University of Technology
Shuowen Lan Dalian University of Technology

Parallel Session 3

Parallel Session 3 Aug 3, Sunday, 14:00-18:00
Oral Session 3 Function Room 3

Sun-R.03 Advanced Control and Path Planning of Space Robots

Chair: Gang Chen Beijing University of Posts and Telecommunications
Chair: Xiaodong Zhang China Academy of Space Technology
Chair: Shiyuan Jia Beijing University of Posts and Telecommunications

●Oral-01 14:00-14:15

[0307] GKNet: Graph-based Keypoints Network for Monocular Pose Estimation of Non-cooperative Spacecraft

Weizhao Ma Harbin Institute of Technology
Zhou Dong Harbin Institute of Technology
Yuhui Hu Beijing Institute of Technology
Zipeng He China Academy of Space Technology

●Oral-02 14:15-14:30

[0105] Deployment Strategy for Solar Sails From a Resonant Periodic Orbit in the Bicircular Restricted Four-Body Problem

Shiyu An Harbin Institute of Technology
Ming Liu Harbin Institute of Technology
Huayi Li Harbin Institute of Technology
Fan Wu Harbin Institute of Technology

●Oral-03 14:30-14:45

[0460] Bridging the Synthetic-To-Real Gap in Spacecraft Recognition: A Hardware-In-The-Loop Dataset

Shengyun Zhao Beihang University
Youchen Fan Beihang University
Rui Zhong Beihang University
Linyan Cui Beihang University

●Oral-04 14:45-15:00

[0536] Comparative Analysis of Capture Control Strategies for Space Robots

Xinhui Xia Shanghai Aerospace Control Technology Institute
Ran Shi Shanghai Aerospace Control Technology Institute
Shan Lu Shanghai Aerospace Control Technology Institute
Zhenyu Cao Shanghai Aerospace Control Technology Institute

●Oral-05 15:00-15:15

[0033] A Novel Control Strategy for Spacecrafts Approaching Tumbling Targets in Close-Proximity Rendezvous Mission

Bowen Zhan Beijing Institute of Control Engineering

Yulian Gong	Beijing Institute of Control Engineering
Xiaoxiang Liu	Beijing Institute of Control Engineering
Yingzi He	Beijing Institute of Control Engineering

●Oral-06 15:15-15:30

0518 Iterative Learning Control of Underactuated Space Manipulators

Yingzhuo Fu	Guangdong Ocean University
Gang Chen	Beijing University of Posts and Telecommunications
Haitao Liu	South China University of Technology
Dan Liu	Beijing University of Posts and Telecommunications

●Oral-07 15:30-15:45

0175 Trajectory Optimization of a Three-Branch Robot for Stable Climbing on Complex Space Trusses

Xiyun Guo	Beijing University of Posts and Telecommunications
Yifan Wang	Beijing University of Posts and Telecommunications
Liang Tang	Beijing Institute of Control Engineering
Shiyuan Jia	Beijing University of Posts and Telecommunications
Qinghe Kong	Beijing University of Posts and Telecommunications
Gang Chen	Beijing University of Posts and Telecommunications

●Oral-08 16:00-16:15

0166 Adaptive Admittance Control with Visual Feedback in Space Capture

Han Lu	Beijing Institute of Spacecraft System Engineering
Ruiyang Zhang	Beijing University of Posts and Telecommunications
Yizhuang Zhang	China Aerospace Science and Technology Corporation
Xiaodong Zhang	China Academy of Space Technology
Bin Chen	Beijing University of Posts and Telecommunications

●Oral-09 16:15-16:30

0099 Deep Reinforcement Learning-Based Trajectory Planning for Space Robots Avoiding Dynamic Singularities

Rongyu Jin	Beijing Institute of Control Engineering
Yunhai Geng	Harbin Institute of Technology
Xinru Xie	Beijing Institute of Control Engineering
Chongxiao Zhong	Beijing Institute of Control Engineering
Yuan Huang	Beijing Institute of Control Engineering
Yuanzhuo Geng	Beijing Institute of Control Engineering

●Oral-10 16:30-16:45

0458 Hybrid A* Algorithm Based on Continuous Sampling and Dynamic Neighborhood Evaluation and Its Application in Asteroid Surface Path Planning

Hongda Ge	Taiyuan University of Technology
Boyang Sun	Tsinghua University
Yonglong Zhang	Taiyuan University of Technology

●Oral-11 16:45-17:00

0106 Dissipativity-Based Sliding Mode Control for Switched Systems under ET-WTODP

Te Yu	Harbin University of Science and Technology
Hongxu Zhang	Harbin University of Science and Technology
Yumeng Zhao	Harbin University of Science and Technology

Xiaoman Chen	Harbin University of Science and Technology
Siwen Ding	Harbin University of Science and Technology

●Oral-12 17:00-17:15

0387 High-Fidelity In-Orbit Training System for Manual Rendezvous and Docking on Tiangong Space Station

Yan Wang	Beijing Institute of Control Engineering
Biao Cai	Beijing Institute of Control Engineering
Dan Yu	Beijing Institute of Control Engineering
Jinjiang Zhang	Beijing Institute of Control Engineering
Zengbo Liu	Beijing Institute of Control Engineering
Zhiyu Li	Beijing Institute of Control Engineering
Xiaoguang Song	Beijing Institute of Control Engineering
Shuai Feng	Beijing Institute of Control Engineering

Parallel Session 4

Parallel Session 4 — Aug 3, Sunday, 14:00-18:00
Oral Session 4 — Grand Ballroom 2

Sun-R.04 Micro- and nano-satellites and education

Chair: Paolo Castaldi	University of Bologna
Chair: Huayi Li	Harbin Institute of Technology
Chair: Yunhua Wu	Nanjing University of Aeronautics and Astronautics

●Oral-01 14:00-14:15

0364 Research on Relative Navigation Algorithm for Micro-Nano Satellites Based on Onboard GNSS Information

Fei Wang	Shandong Aerospace Electro-technology Institute
Zhongzheng Zhang	Shandong Aerospace Electro-technology Institute
Fei Han	Shandong Aerospace Electro-technology Institute
Mingxiang Li	Shandong Aerospace Electro-technology Institute
Shaojun Mou	Shandong Aerospace Electro-technology Institute

●Oral-02 14:15-14:30

0280 Propulsion-Free Orbital Control Method for Micro-Nano Satellite Constellations Based on Optimized Atmospheric Differential Drag Strategy

Xiangyu Li	Space Star Technology Co., Ltd.
Linxi Lei	Harbin Institute of Technology

●Oral-03 14:30-14:45

0350 Multi-objective Optimization for Control Allocation A Games-in-Games Framework

Shangming Li	Nanjing University of Aeronautics and Astronautics
Hao Yang	Nanjing University of Aeronautics and Astronautics
Yuan Ni	Nanjing University of Aeronautics and Astronautics
Bin Jiang	Nanjing University of Aeronautics and Astronautics

●Oral-04 14:45-15:00

0431 Uniform-Deployment Control of Nanosatellite Formation Flying on Irregular Curves for Cooperative Observation

Hao Zhou	Northwestern Polytechnical University
Zhaohui Dang	Northwestern Polytechnical University

●Oral-05 15:00-15:15

[0039] Deep Neural Network-Based Intelligent Evaluation Method for Space Target Group Value

Yuyang Xue	Sun Yat-sen University
Lingfeng Zhao	Innovation Academy for Microsatellites of CAS
Tao Wang	Sun Yat-sen University

●Oral-06 15:15-15:30

[0213] On-Orbit Capacity Estimation for Satellite Lithium Batteries Based on Seeker Optimization Algorithm and Kalman Filter

Tianxing Chen	Harbin Institute of Technology
Yufeng Zhang	Harbin Institute of Technology
Zhi Yin	Harbin Institute of Technology

●Oral-07 15:30-15:45

[0043] Research on Power Prediction Method for MPPT Control in Fluctuating Irradiance Conditions of Satellites

Zhi Yin	Harbin Institute of Technology
Yufeng Zhang	Harbin Institute of Technology
Tianxing Chen	Harbin Institute of Technology
Xueqin Chen	Harbin Institute of Technology
Jian Chen	Harbin Institute of Technology

●Oral-08 16:00-16:15

[0076] Design and Implementation of Electrical Power System for LilacSat-3 with Digital Energy Management

Tianxing Chen	Harbin Institute of Technology
Zhi Yin	Harbin Institute of Technology
Xiyuan Yang	Harbin Institute of Technology
Ziyi He	Harbin Institute of Technology

●Oral-09 16:15-16:30

[0286] Design and Implementation of Fault-Tolerant Compensation for Hall Sensor Signals in CMG Inner Gimbal Motor

Rui Pan	Shanghai Aerospace Control Technology Institute
Chengyu Zhou	Shanghai Aerospace Control Technology Institute
Youtao Shen	Shanghai Aerospace Control Technology Institute
Yanbo Zhu	Shanghai Aerospace Control Technology Institute
Zhenyu Cao	Shanghai Aerospace Control Technology Institute

●Oral-10 16:30-16:45

[0261] Attitude Tracking Control of Ultra-Low Orbit Disksat Using Mass Moment

Yu Dai	Harbin Institute of Technology
Weigang Shi	Deep Space Exploration Laboratory
Fan Wu	Harbin Institute of Technology

●Oral-11 16:45-17:00

[0382] Adaptive MPC for Active Atmospheric Torque Control in Disk-shaped Microsatellite

Chao Wei	Harbin Institute of Technology
Zhuowei Yu	Harbin Institute of Technology
Rui Zou	Harbin Institute of Technology

●Oral-12 17:00-17:15

[0562] Dual-Gas H2/He Airship Design: Optimized Buoyancy and PID-Based Altitude Control

MD Monjur A Alahi Atib	Beihang University
Hira Ambreen	Beihang University
Muhammad Imran	Henan University
Lei Wang	Beihang University

Parallel Session 5

Parallel Session 5	Aug 3, Sunday, 14:00-18:00
Oral Session 5	Grand Ballroom 3

Sun-R.05 Space Traffic Management

Chair: Yazhong Luo	National University of Defense Technology
Chair: Peng Shu	Yunnan Observatory of Chinese Academy of Science

●Oral-01 14:00-14:15

[0301] A Multimodal Spatial Non-Cooperative Target Intent Recognition Method Based on Dynamic Attention and Cross-Modal Interaction

Tian Ma	Xi'an University of Science and Technology
Wanzhu Ren	Xi'an University of Science and Technology
Chuyang Shang	Xi'an University of Science and Technology
Shaofeng Ma	Xi'an University of Science and Technology
Jiahui Li	Xi'an University of Science and Technology

●Oral-02 14:15-14:30

[0204] Rapid Orbit Determination Strategy of Mega-Constellation Using Satellite-Ground and Inter-Satellite Link Observations

Yang Hu	National University of Defense Technology
Zhen Yang	National University of Defense Technology
Yazhong Luo	National University of Defense Technology
Shunyi Chen	National University of Defense Technology

●Oral-03 14:30-14:45

[0069] System Research on Airline-flight-mode Payload Transportation of Shenzhou Manned Spacecraft

Huakang Peng	Beijing Institute of Spacecraft System Engineering

●Oral-04 14:45-15:00

[0174] The Transfer Trajectory Design from the Earth Orbit to Distant Retrograde Orbit under the Ephemeris Model

Yiyun You	National University of Defense Technology
Dongxu Li	National University of Defense Technology
Guanwei He	National University of Defense Technology

●Oral-05 15:00-15:15

[0187] Dynamics Modeling and Vibration Control of a Flexible Structure Transportation System

Shiyuan Jia	Beijing University of Posts and Telecommunications
Yinbo Zhang	Beijing University of Posts and Telecommunications
Liang Tang	Beijing Institute of Control Engineering
Shukui Zhang	Beijing University of Posts and Telecommunications
Gang Chen	Beijing University of Posts and Telecommunications
Yifan Wang	Beijing University of Posts and Telecommunications

●Oral-06 15:15-15:30

0352 Earth-Moon Resonant Halo Orbit Design via a Hybrid Heuristic Optimization Strategy with a Polynomial Fitting Technique

Yuanqiang Cao	National University of Defense Technology
Dongxu Li	National University of Defense Technology
Guanwei He	National University of Defense Technology

●Oral-07 15:30-15:45

0277 Networked Predictive Formation Control Strategy for Multi-Agent Systems under Multi-Layer Leader-Follower Architecture

Wenxin Lu	Information Engineering University
Lei Cao	Information Engineering University
Jie Huang	Information Engineering University
Dexiu Hu	Information Engineering University
Nan Wu	Information Engineering University
Jingjing Yang	Information Engineering University

●Oral-08 16:00-16:15

0534 APF-A3C-Based Attitude Control for Spacecraft with Time-Varying Pointing Constraints

Jiazhe Zhu	National University of Defense Technology
Yuehe Zhu	National University of Defense Technology
Yazhong Luo	National University of Defense Technology
Hanwei Wang	National University of Defense Technology
Yuelong Luo	National University of Defense Technology
Lingyue Kong	National University of Defense Technology

●Oral-09 16:15-16:30

0368 Research on Hidden Maneuvering Strategy of GEO Spacecraft in the Shadow Zone

Longxun Yin	China Academy of Aerospace System and Innovation
Qingze Zhang	China Academy of Aerospace System and Innovation
Jinggong Wang	China Academy of Aerospace System and Innovation
Ye Shi	China Academy of Aerospace System and Innovation
Zijie Wang	China Academy of Aerospace System and Innovation
Jingxuan Wang	China Academy of Aerospace System and Innovation

●Oral-10 16:30-16:45

0202 A Learning-Based Method for Predicting the Behavior Pattern of the Attacking Spacecraft in Orbital Game

Ziming Shi	National University of Defense Technology
Yuehe Zhu	National University of Defense Technology

●Oral-11 16:45-17:00

0476 Optimal Control of Linear Time-Varying Systems through Reachable Set Geometric Analysis

Lin Xin	Harbin Institute of Technology
Gang Zhang	Harbin Institute of Technology
Rafael Vazquez	Universidad de Sevilla

●Oral-12 17:00-17:15

0273 Perturbation Orbit Prediction Method Based on Physics-Informed ResNet

Meng Zhao	National University of Defense Technology
Peng Shu	Yunnan Observatory of Chinese Academy of Science
Zhen Yang	National University of Defense Technology

Yazhong Luo — National University of Defense Technology

●Oral-13 17:15-17:30

[0097] Precision Orbit Determination for Low-orbit Satellite Formations under Manoeuvring Conditions

Mingkai Huang — Bauman Moscow State Technical University
Lifei Zhang — National University of Defense Technology
Xianjian Zhang — National University of Defense Technology

●Oral-14 17:30-17:45

[0137] Reentry Guidance Method for Reusable Launch Vehicles Based on GRU-DDPG

Xinyu Xu — Harbin Institute of Technology
Kelong Han — Harbin Institute of Technology
Changsheng Gao — Harbin Institute of Technology
Wuxing Jing — Harbin Institute of Technology

Parallel Session 6

Parallel Session 6 — Aug 4, Monday, 10:15-12:15
Oral Session 6 — VIP Room

Mon-R.06 Guidance and Control for High-Speed Fight in Trans-Domain Complex Environment

Chair: Haipeng Chen — China Academy of Launch Vehicle Technology
Chair: Feng Zhang — China Academy of Launch Vehicle Technology
Chair: Changzhu Wei — Harbin Institute of Technology

●Oral-01 10:15-10:30

[0339] Research on Formation Transformation Technology for High-Speed Aircraft Based on Model-Based Reinforcement Learning

Qinghua Teng — China Academy of Launch Vehicle Technology

●Oral-02 10:30-10:45

[0156] Design of a Game-Theoretic Guidance Law for Leader-Follower Aircraft with Target Estimation

Zhenyan Wei — Harbin Institute of Technology
Feiyi He — Shanghai Aerospace Control Technology Institute
Kun Qian — Harbin Institute of Technology
Yu Song — System of Systems and Artificial Intelligence Laboratory
Yunfan Zhou — System of Systems and Artificial Intelligence Laboratory

●Oral-03 10:45-11:00

[0411] Coupling-Informed Data-Driven Intelligent Control for Hypersonic Vehicle with Nonminimum Phase Properties

Shuowen Lan — Dalian University of Technology
Yuefang Wang — Dalian University of Technology
Shenghao Wu — Dalian University of Technology
Linfei Hou — Dalian University of Technology
Guan Wang — Dalian University of Technology

●Oral-04 11:00-11:15

[0360] BTIRL: Behavior Tree Integrated Reinforcement Learning for Hypersonic Penetration-Guidance

Yuanjie Meng — Northwestern Polytechnical University
Zhiguo Han — School of Astronautics Northwestern Polytechnical University

●Oral-05 11:15-11:30

[0528] Learning-Based Interception Strategy under High-Frequency Decision-Making Scenarios

Ye Zhang — Northwestern Polytechnical University
Wang Zhao — Northwestern Polytechnical University
Jingyu Wang — Northwestern Polytechnical University

●Oral-06 11:30-11:45

[0123] An Intelligent Hierarchical Framework for High-Speed Morphing Vehicle: Online Planning and Strong Adaption

Honglin Liu — Dalian University of Technology
Guan Wang — Dalian University of Technology
Shuaibin An — Dalian University of Technology
Shaojie Ma — China Academy of Launch Vehicle Technology
Kai Liu — Dalian University of Technology

●Oral-07 11:45-12:00

[0250] Dynamic Characteristics Analysis and Trajectory Designing for a Morphing Space Transportation Vehicle

Haoliang Wang — China Academy of Launch Vehicle Technology
Xiaojiu Zhang — China Academy of Launch Vehicle Technology
Haichuan Yu — China Academy of Launch Vehicle Technology

●Oral-08 12:00-12:15

[0209] Trajectory Optimization and Tracking Control for Tactical Energy Maneuvering

Zhe Dong — Dalian University of Technology
Zhenwei Wang — Dalian University of Technology
Zeming Qi — Dalian University of Technology
Kai Liu — Dalian University of Technology

Parallel Session 7

Parallel Session 7 — Aug 4, Monday, 10:15-11:45
Oral Session 7 — Function Room 2

Mon-R.07 Space Intelligent Equipment: Technologies and Applications

Chair: Qiang Zhang — Beijing Institute of Control Engineering
Chair: Aiguo Song — Southeast University

●Oral-01 10:15-10:30

[0553] Actuation to Sensing Noise Crosstalk Investigation in the Inertial Sensor Front-end Electronics

Yu Xiang — Shanghai Jiao Tong University
Qianyun Zhang — Shanghai Jiao Tong University
Shufan Wu — Shanghai Jiao Tong University

●Oral-02 10:30-10:45

[0578] Research on Mechanical Equipment Remaining Useful Life Prediction Method Based on Attention Mechanism and Feature Fusion

Hongjian Song — Harbin Institute of Technology
Fuhong Xiao — Harbin Institute of Technology
Yunjia Dong — Harbin Institute of Technology
Xiaoen Feng — Harbin Institute of Technology
Mingjia Lei — Harbin Institute of Technology
Yuqing Li — Harbin Institute of Technology

●Oral-03 10:45-11:00

[0585] Design and Control of Micro-Radian Inertial Stabilization Laser Platform

Jianhang Li Northwestern Polytechnical University
Zhenglin Yang Northwestern Polytechnical University
Qing Li Northwestern Polytechnical University
Lei Liu Northwestern Polytechnical University

●Oral-04 11:00-11:15

[0434] Design of Multifunctional End-Effectors for On-Orbit Maintenance Operations

Zeyang Zhong Shanghai Jiao Tong University
Jun He Shanghai Jiao Tong University

●Oral-05 11:15-11:30

[0591] A Multimodal Shared Telerobotic System of Three-Arm Space Robot for Extravehicular Activities

Mutian He Southeast University
Aiguo Song Southeast University
Yibing Yan Southeast University
Huailiang Ma Southeast University

●Oral-06 11:30-11:45

[0570] Development and Prospect of Solar Array Drive Assembly for Spacecraft

Qiang Zhang Beijing Institute of Control Engineering
Yanmin Liu Beijing Institute of Control Engineering
Guoqing Yu Beijing Institute of Control Engineering
Ke Zhang Beijing Institute of Control Engineering

Parallel Session 8

Parallel Session 8 Aug4, Monday, 10:15-11:45
Oral Session 8 Function Room 3

Mon-R.08 Advanced Propulsion
Chair: Wen Li Beijing Institute of Control Engineering
Chair: Jintao Liu Beijing Institute of Control Engineering
Chair: Liqiu Wei Harbin Institute of Technology

●Oral-01 10:15-10:30

[0290] Numerical Simulation of the Heat Capacity Method for Surface Tension Plate Tank in Microgravity Environment

Liang Zhang Zhejiang Sci-Tech University
Jiayi Zhou Zhejiang Sci-Tech University
Lulu Zhai Zhejiang Sci-Tech University

●Oral-02 10:30-10:45

[0259] Absorbed-Evolved Mass-Transfer and Flowing Characteristics in a Space Micropump

Zhipeng Ren Harbin Institute of Technology
Fei Song Beijing Institute of Control Engineering
Jintao Liu Beijing Institute of Control Engineering
Xiaolong Fu Harbin Institute of Technology
Deyou Li Harbin Institute of Technology

●Oral-03 10:45-11:00

0478 On-Orbit Thrust Estimation Method by BR-BPNN for Hall Thrusters

Ziying Ren — Harbin Institute of Technology
Xiufeng Zhong — Beijing SunWise Space Technology Ltd.
Han Liang — Beijing Institute of Control Engineering
Liqiu Wei — Harbin Institute of Technology

●Oral-04 11:00-11:15

0471 Design and Simulation Verification of Feedback Control System for Noise Suppression of Microwave Discharge Ion Thruster

Chenjun Xu — Harbin Institute of Technology
Xiang Niu — Harbin Institute of Technology
Daren Yu — Harbin Institute of Technology

●Oral-05 11:15-11:30

0483 Sliding Mode Control for Discharge Stability Under Mode Transition in Microwave Cusped Field Thruster

Hongbo Zhou — Harbin Institute of Technology
Daren Yu — Harbin Institute of Technology

●Oral-06 11:30-11:45

0341 Experimental Investigation of Plasma Spoke Oscillation Control and Performance Optimization in Planar Hall Thrusters

Lingxi Chen — Beihang University
Weizong Wang — Beihang University
Wei Liu — Beihang University
Guangchuan Zhang — Beihang University

Parallel Session 9

Parallel Session 9 — Aug 4, Monday, 10:15-11:45
Oral Session 9 — Meeting Room

Mon-R.09 Space Debris Mitigation

Chair: Zhen Yang — National University of Defense Technology
Chair: Zhiliang Wu — Tianjin University

●Oral-01 10:15-10:30

0066 Debris Cloud Evolution in Cislunar Space Using Eulerian Perspective Method

Haiyi Wang — National University of Defense Technology
Zhen Yang — National University of Defense Technology
Xiang Guo — National University of Defense Technology

●Oral-02 10:30-10:45

0393 Integrated Mission Planning for Multiple Spacecrafts On-Orbit Servicing and Debris Removal

Rui Shao — Harbin Institute of Technology
Yingchun Li — Shanghai Institute of Aerospace System Engineering
Bin Song — Shanghai Institute of Aerospace System Engineering
Yanning Guo — Harbin Institute of Technology

●Oral-03 10:45-11:00

0385 Data-Driven Modeling and Control of Tethered Satellite Dynamics Based on the Koopman Operator

Zhifeng Liao — Nanjing University of Aeronautics and Astronautics

Ti Chen	Nanjing University of Aeronautics and Astronautics

●Oral-04 11:00-11:15

0549 Small Space Debris Removal Using Space-based Low Pulse Energy Lasers

Shuozi Wang	Tianjin University
Ti Chen	Nanjing University of Aeronautics and Astronautics
Jiangwen Chao	Tianjin University
Zitong Li	Tianjin University
Xusong Shao	Tianjin University
Qunzhi Li	Beijing Institute of Spacecraft System Engineering
Huawei Liu	Beijing Institute of Spacecraft System Engineering

●Oral-05 11:15-11:30

0398 Optimization of space debris removal sequence using dynamic programming with hazard index consideration

Vadim Kravchenko	Moscow Aviation Institute
Alexey Ivanyukhin	Research Institute of Applied Mechanics and Electrodynamics (Moscow Aviation Institute) / RUDN University

●Oral-06 11:30-11:45

0157 De-spinning Trajectory Optimization of Tethered Satellite During Debris Removal

Ruiqi Yang	Beihang University
Dapeng Lian	Beihang University
Haoyu Wang	China Academy of Space Technology
Guowei Zhao	Beihang University

Parallel Session 10

Parallel Session10	Aug 4, Monday, 10:15-12:00
Oral Session 10	Grand Ballroom 2

Mon-R.10 Game Decision and Control for Non-cooperative Space Targets

Chair: Youmin Gong	Harbin Institute of Technology, Shenzhen
Chair: Xiaozhe Ju	Harbin Institute of Technology, Shenzhen

●Oral-01 10:15-10:30

0438 Differential Game Approach to Orbital Pursuit-Evasion Problems

Ruoshen Li	Beijing Institute of Technology
Donglin Xue	Beijing Aerospace Automatic Control Institute
Xiaoyu Lang	Beijing Institute of Technology
Xiangdong Liu	Beijing Institute of Technology
Zhen Chen	Beijing Institute of Technology

●Oral-02 10:30-10:45

0178 Integrated Robust Control and Approximate Dynamic Programming for Spacecraft Pursuit-Evasion Games under Uncertain Dynamics

Yiran Ma	Beijing Institute of Technology
Lincheng Li	Beihang University
Jingrui Zhang	Beijing Institute of Technology
Ao Shen	Beijing Institute of Technology

●Oral-03 10:45-11:00

0333 Incomplete-Information Multi-Spacecraft Orbital Target-Attacker-Defender Game

Jiaxin Shi	Harbin Institute of Technology
Baolin Wu	Harbin Institute of Technology
Yanbing Guo	Harbin Institute of Technology
Xiaohui Lin	Harbin Institute of Technology

●Oral-04 11:00-11:15

[0285] Flexible Performance Attitude Fault-Tolerant Control Based on Disturbance Observer

Hujun Peng	Harbin Institute of Technology, Shenzhen
Feixiong Long	Harbin Institute of Technology, Shenzhen
Ying Zhang	Harbin Institute of Technology, Shenzhen

●Oral-05 11:15-11:30

[0148] Fast Estimation of Lambert Transfer Duration for GEO Spacecraft Rendezvous Missions Based on Residual Neural Network

Leixiang Sun	Harbin Institute of Technology, Shenzhen
Xiao Pan	Shanghai Institute of Spaceflight Control Technology
Youmin Gong	Harbin Institute of Technology, Shenzhen
Yanning Guo	Harbin Institute of Technology
Guangfu Ma	Harbin Institute of Technology

●Oral-06 11:30-11:45

[0365] Observer Based Finite-time Control for Spacecraft Reorientation with Multiple Constraints

Qingsong Li	Beijing Institute of Technology
Guotao Zhao	Beijing Institute of Technology
Bing Cui	Beijing Institute of Technology
Yuanqing Xia	Beijing Institute of Technology

●Oral-07 11:45-12:00

[0371] Nash Equilibrium of Spacecraft Pursuit-evasion Game Based on Deep Reinforcement Learning

Guang Li	Beijing Institute of Technology
Yan Peng	Beijing Institute of Technology
Yang Chen	Beijing Institute of Technology
Bing Cui	Beijing Institute of Technology
Yuanqing Xia	Beijing Institute of Technology

Parallel Session 11

Parallel Session11	Aug 4, Monday, 10:15-12:15
Oral Session 11	Grand Ballroom 3

Mon-R.11 Advanced Theories and Applications of Very Low Earth Orbit Spacecraft

Chair: Dong Qiao	School of Aerospace Engineering, Beijing Institute of Technology
Chair: Xiangyuan Zeng	Beijing Institute of Technology
Chair: Jianqing Li	Hangzhou Dianzi University

●Oral-01 10:15-10:30

[0444] Autonomous Optical Navigation Using Very Short-Arc Observations of a Single Near-Earth Satellite

Tianci Liu	Beijing Institute of Technology
Wangda Tan	Beijing Institute of Technology
Xiangyuan Zeng	Beijing Institute of Technology

●Oral-02 10:30-10:45

[0584] Trajectory Design of the Aeroassisted Orbital Rendezvous with Strict Time Constraint by Sequential Convex Programming

Xiangdong Feng	Beijing Institute of Technology
Dong Qiao	Beijing Institute of Technology
Hongwei Han	Beijing Institute of Technology
Yawen Zhang	Beijing Institute of Technology

●Oral-03 10:45-11:00

[0108] Two-Phase Impulse Maneuvers Strategy for Long-Range Guidance Spacecraft Rendezvous

Jianqing Li	Hangzhou Dianzi University
Tongtong Deng	Space Information Research Institute and Zhejiang Key Laboratory
Zhaohui Song	Zhejiang Key Laboratory of Space Information Sensing and Transmission

●Oral-04 11:00-11:15

[0375] Integrated Trajectory Optimization for Deorbit-Reentry of Re-Entry Spacecraft

Yuyang Dong	Harbin Institute of Technology
Baolin Wu	Harbin Institute of Technology
Junyu Chen	Harbin Institute of Technology

●Oral-05 11:15-11:30

[0113] Rapid Trajectory Planning for Launch Vehicle Based on Deep Neural Network and Particle Swarm Differential Evolution Optimization

Jiaming Ye	Harbin Institute of Technology

●Oral-06 11:30-11:45

[0442] Nonlinear Optimization Positioning Method for Planetary Landing Navigation Using Shadow Constraints

Yufei Guo	Beijing Institute of Technology
Qingyuan Yan	Beijing Institute of Technology
Xiangyuan Zeng	Beijing Institute of Technology

●Oral-07 11:45-12:00

[0001] A Switching Prescribed Performance Control Approach for Attitude Control of RLVs with Finite-Time Convergence

Henry David	Université de Bordeaux
Donghe Chen	Northwestern Polytechnical University
Jing Chang	Xidian University
Jérôme Cieslak	University of Bordeaux
Alejandra Ferreira	CONACyT at CITEDI-IPN

●Oral-08 12:00-12:15

[0004] An Improved AAC Method for Elastic Vibration Inhibition in Launch Vehicles

Yihui Ruan	Huazhong University of Science and Technology
Keer Chen	Huazhong University of Science and Technology
Lei Liu	Huazhong University of Science and Technology
Huijin Fan	Huazhong University of Science and Technology
Bo Wang	Huazhong University of Science and Technology

Parallel Session 12

Parallel Session12 — Aug 4, Monday, 14:00-18:00
Oral Session 12 — VIP Room

Mon-R.12 Intelligent Autonomous Swarm Perception Decision-Making Control and Applications

Chair: Zexu Zhang	Harbin Institute of Technology
Chair: Liang Zhang	Anhui University
Chair: Hutao Cui	Harbin Institute of Technology

●Oral-01 14:00-14:15

[0092] A No-Reference Spacecraft Image Quality Assessment for Image selection

Mengmeng Yuan	Harbin Institute of Technology
Zexu Zhang	Harbin Institute of Technology
Yu Su	Harbin Engineering University

●Oral-02 14:15-14:30

[0144] Cooperative Planning Method for Satellite Relay Tracking Based on Spatio-Temporal Graph Neural Network

Shuxin Shen	Harbin Institute of Technology
Hutao Cui	Harbin Institute of Technology
Zexu Zhang	Harbin Institute of Technology
Weimin Bao	China Aerospace Science and Technology Corporation
Tianhao Zhou	Harbin Institute of Technology

●Oral-03 14:30-14:45

[0583] A Mixed-Logical-Dynamical Model for Multi-Robot Lunar Construction Task Allocation

Feiyu Gao	Harbin Institute of Technology
Xiaowei Wang	China Academy of Launch Vehicle Technology
Shuai Yuan	Harbin Institute of Technology

●Oral-04 14:45-15:00

[0429] Autonomous Mission Planning for Space-Based Multi-Satellite Interception Using an Improved Genetic Algorithm

Huinan Liu	Harbin Institute of Technology
Hutao Cui	Harbin Institute of Technology
Peng Guo	Harbin Institute of Technology

●Oral-05 15:00-15:15

[0087] Fully Distributed Predefined-Time Affine Formation Maneuver Control for Fixed-Wing UAVs

Chao Yan	Harbin Institute of Technology
Tianlai Xu	Harbin Institute of Technology
Beixiao Zhu	ShanghaiTech University
Kai Zhang	Harbin Institute of Technology
Jiahang Li	Harbin Institute of Technology
Jinlong Liu	Harbin Institute of Technology

●Oral-06 15:15-15:30

[0159] Multi-Objective Design of Direct Transfers between Libration Point Orbits Via Deep Learning Method

Yiyu Wang	Harbin Institute of Technology
Zexu Zhang	Harbin Institute of Technology
Weimin Bao	China Aerospace Science and Technology Corporation
Yuhang Luo	Harbin Institute of Technology

●Oral-07 15:30-15:45

[0093] SwinFPN:A Pose Estimation Method Adapted to Multi-Scale Variations of Space Targets

Fan Zhang	Harbin Institute of Technology

Zexu Zhang	Harbin Institute of Technology
Zhuo Song	Harbin Institute of Technology
Yicheng Mao	Harbin Institute of Technology

●Oral-08 16:00--16:15

0094 Utilizing Synthetic Event Camera Data for Component Robust Detection in Spacecraft Rendezvous Scenarios

Zhuo Song	Harbin Institute of Technology
Zexu Zhang	Harbin Institute of Technology
Fan Zhang	Harbin Institute of Technology
Yicheng Mao	Harbin Institute of Technology

●Oral-09 16:15--16:30

0244 Optimal Placement of Positioning Service for Multi-Robot System using Relative Angle Measurement

Kangwen Lin	Anhui University
Liang Zhang	Anhui University
Zhaochen Liu	Anhui University
Yuxuan Hu	Anhui University

●Oral-10 16:30--16:45

0136 Space-Based Distributed Control Method for Low Earth Orbit Mega-Constellations

Tong Liu	Harbin Institute of Technology
Weimin Bao	China Aerospace Science and Technology Corporation
Zexu Zhang	Harbin Institute of Technology
HaoYu Wang	Harbin Institute of Technology
Ruiyao Li	Harbin Institute of Technology
Hutao Cui	Harbin Institute of Technology

●Oral-11 16:45--17:00

0363 Bio-inspired neighbor selection mechanism and performance evaluation for UAV Swarm: An extended visual-attention model

Zhang Jun	Anhui University
Liang Zhang	Anhui University

●Oral-12 17:00--17:15

0245 Large-Scale Planetary Exploration and Monitoring in a Prior Unknown Environment Using Multi-Rover Systems

Yuxuan Hu	Anhui University
Liang Zhang	Anhui University
Kangwen Lin	Anhui University

●Oral-13 17:15--17:30

0040 Multi-Spacecraft Cooperative Visual 3D Sensing of Noncooperative Target

Qier An	Northwestern Polytechnical University
Jianfa Wu	Beijing Institute of Control Engineering
Chunling Wei	Beijing Institute of Control Engineering

●Oral-14 17:30--17:45

0088 Guiding Vector Field Based Coordinated Path Following in Obstacle Environments

Jingzong Liu	Harbin Institute of Technology
Tianlai Xu	Harbin Institute of Technology
Beixiao Zhu	ShanghaiTech University

Guodong Chen	Harbin Institute of Technology
Kun Yu	Harbin Institute of Technology

Parallel Session 13

Parallel Session13	Aug 4, Monday, 14:00-18:00
Oral Session 13	Function Room 2

Mon-R.13 Contemporary Advances in AI and Its Application in Aerial Systems

Chair: Chaoyong Li	Zhejiang University
Chair: Kebo Li	National University of Defense Technology
Chair: Miao Yu	Zhejiang University
Chair: Cong Zhou	Zhejiang University

●Oral-01 14:00-14:15

[0388] Research on Parafoil Precision Landing Method Based on DDPG

Qi Feng	National University of Defense Technology
Qingbin Zhang	National University of Defense Technology
Yujiao Huang	National University of Defense Technology
Linhong Li	National University of Defense Technology

●Oral-02 14:15-14:30

[0455] Unmanned Swarm System Decision-Making Based on Heterogeneous Mean Field Reinforcement Learning

Tong Zou	Zhejiang University
Chaoyong Li	Zhejiang University
Sai Chen	Zhejiang University

●Oral-03 14:30-14:45

[0512] Unmanned Aerial Vehicle Swarm Air Combat Confrontation Based on Mean Field Q-function Reinforcement Learning

Kaining Hu	Zhejiang University
Tong Zou	Zhejiang University
Miao Yu	Zhejiang University
Chaoyong Li	Zhejiang University

●Oral-04 14:45-15:00

[0205] Interceptor Trajectory Prediction Algorithm Using Different Gaussian Processes

Bowei Yan	Harbin Institute of Technology
Runle Du	National Key Laboratory of Science and Technology on Test Physics and Numerical Mathematics
Xiaojun Ban	Harbin Institute of Technology
Di Zhou	Harbin Institute of Technology

●Oral-05 15:00-15:15

[0262] Research on Missile-Target Game Guidance Strategy Based on Stackelberg Game

Linze Du	Zhejiang University
Xiaodong Wang	Beijing Institute of Electronic System Engineering
Sai Chen	Zhejiang University
Chaoyong Li	Zhejiang University

●Oral-06 15:15-15:30

[0579] PER-TD3 Driven Real-Time Midcourse Trajectory Planning for High-Speed Maneuvering Target Interception

Boyang Ji	Air Force Engineering University
Jiong Li	Air Force Engineering University
Lei Shao	Air Force Engineering University
Jikun Ye	Air Force Engineering University
Jinlin Zhang	Air Force Engineering University
Xueqian Wang	Air Force Engineering University

●Oral-07 15:30-15:45

0477 Fast Linear Covariance Method for Uncertainty Analysis Using Pseudospectral Collocation

Yutong Hu	Zhejiang University
Cong Zhou	Zhejiang University
Qilun Zhao	Beijing Institute of Electronic System Engineering
Hua Xiong	Beijing Institute of Electronic System Engineering
Yiji Zhu	Zhejiang University
Chaoyong Li	Zhejiang University

●Oral-08 16:00-16:15

0526 LSTM-optimized Atmospheric Density Correction for Accurate Stellar Refraction-based Navigation in Spacecraft

Dingjie Wang	National University of Defense Technology
Hang Yang	National University of Defense Technology
Hongbo Zhang	National University of Defense Technology

●Oral-09 16:15-16:30

0599 MADDPG-Based Impulsive Maneuver Strategy for Many-To-One Spacecraft Games

Chengming Zhang	National University of Defense Technology
Yanwei Zhu	National University of Defense Technology
Yi Ren	National University of Defense Technology
Peng Lv	National University of Defense Technology
Leping Yang	National University of Defense Technology

●Oral-10 16:30-16:45

0447 Optimization-Based Fixed-Wing UAV Path Planning with Obstacle Avoidance

Yu Zhou	National University of Defense Technology
Chang Wang	National University of Defense Technology
Zehao Xiong	National University of Defense Technology
Jie Li	National University of Defense Technology
Xiangke Wang	National University of Defense Technology

●Oral-11 16:45-17:00

0084 Gaussian Process-Based Self-Learning Attitude Control of Flight Vehicle with State Constraint and Unmodeled Dynamics

Xu Huang	Tsinghua University
Yue Peng	Beijing Aerospace Automatic Control Institute
Jiarun Liu	Beihang University
Shaobing Xu	Tsinghua University

●Oral-12 17:00-17:15

0320 Optimal Midcourse Guidance Law and Cooperative Encirclement Hunting of Hypersonic Missile Group on Radau Pseudo-spectral Method

Yuxin Yang	Harbin Institute of Technology

Tianwei Song — Shanghai Electro-Mechanical Engineering Institute
Chenxing Wang — Harbin Institute of Technology
Yueyong Lyu — Harbin Institute of Technology

●Oral-13 17:15-17:30

[0410] Research on Missile Midcourse Guidance Law Based on Reinforcement Learning in Continuous Space

Haoyu Li — Northwestern Polytechnical University
Haoyu Guo — Northwestern Polytechnical University
Yuhang Yan — Northwestern Polytechnical University
Yu Han — Northwestern Polytechnical University
Jingyu Wang — Northwestern Polytechnical University

●Oral-14 17:30-17:45

[0367] An MARL-Based Method for Midcourse and Terminal Guidance Handover Scenario

Haoyu Li — Northwestern Polytechnical University
Yuhang Yan — Northwestern Polytechnical University
Haoyu Guo — Northwestern Polytechnical University
Yu Han — Northwestern Polytechnical University
Jingyu Wang — Northwestern Polytechnical University

●Oral-15 17:45-18:00

[0210] Adaptive First-Order Hold Discretization-based Sequential Convex Programming Method for Powered Landing Trajectory Optimization

Lei Xie — Nanjing University of Aeronautics and Astronautics
Xinjia Bao — Nanjing University of Aeronautics and Astronautics
Jieyu Zou — Nanjing University of Aeronautics and Astronautics
Gong Zhenyu — Nanjing University of Aeronautics and Astronautics
Shuang Li — Nanjing University of Aeronautics and Astronautics

Parallel Session 14

Parallel Session 14-S1 — Aug 4, Monday, 14:00-16:00
Oral Session 14-S1 — Function Room 3

Mon-R.14 S1: On Advanced Filtering and Control for Complex New Space Missions

Chair: Bin Meng — Beijing Institute of Control Engineering
Chair: Zeguo Wang — Beijing Institute of Control Engineering
Chair: Lijiao Wang — Beijing Institute of Control Engineering
Chair: Gongjun Li — Beijing Institute of Control Engineering

●Oral-01 14:00-14:15

[0086] Adaptive Orbit Control of Drag-Free Spacecraft Subject to Nonholonomic Constraints

Lijiao Wang — Beijing Institute of Control Engineering
Xingyu Gou — Beijing Institute of Control Engineering

●Oral-02 14:15-14:30

[0401] Orbit Propagation of Satellite Method Based on Closed-Loop Net

Wenxing Hong — School of Aerospace Engineering Xiamen University
Jiong Lin — Xiamen University
Duanqin Hong — Xiamen University
Zhenfeng Huang — School of Aerospace Engineering Xiamen University

●Oral-03 14:30-14:45

0071 An Optimal Maneuver Planning Method for the Onboard Gyro Calibration Based on Kalman Filter

Zeguo Wang	Beijing Institute of Control Engineering
Ji Li	Beijing Institute of Control Engineering
Haofan Wang	Beijing Institute of Control Engineering
Yu Zhao	Beijing Institute of Control Engineering
Zhiwen Wang	Beijing Institute of Control Engineering

●Oral-04 14:45-15:00

0588 A Novel Sunlight Avoidance Scheme to Reduce Imaging Blind Time in Satellite Missions

Gongjun Li	Beijing Institute of Control Engineering
Zhixiong Jiang	Beijing Institute of Control Engineering
Xinran Yin	China Space Representative Office
Xiaoxiang Liu	Beijing Institute of Control Engineering
Yu Wang	Beijing Institute of Control Engineering

●Oral-05 15:00-15:15

0395 Trajectory Design for Visiting Multiple Relative Moving Targets

Cunyan Xia	Shandong Technology and Business University
Liang Ma	Beijing Institute of Control Engineering
Yongen Zhao	Harbin Institute of Technology

●Oral-06 15:15-15:30

0089 Tianzhou Cargo Spacecraft All-Phase Autonomous Quick Rendezvous and Docking and In-Orbit Realization

Changqing Chen	Beijing Institute of Control Engineering
Qiang Zhang	Beijing Institute of Control Engineering
Yongchun Xie	Beijing Institute of Control Engineering
Zongyu Liu	Beijing Institute of Control Engineering
Xi Wang	Beijing Institute of Spacecraft System Engineering
Hao Hui	Beijing Institute of Control Engineering

Parallel Session 14-S2 Aug 4, Monday, 16:00-18:00
Oral Session 14-S2 Function Room3

Mon-R.14 S2: Health Monitoring Diagnosis and Reconfiguration

Chair: Chengrui Liu	Beijing Institute of Control Engineering
Chair: Wenjing Liu	Beijing Institute of Control Engineering
Chair: Wenbo Li	Beijing Institute of Control Engineering
Chair: Xiuyun Zhang	Tianjin University

●Oral-01 16:00-16:15

0309 A Distributed Task Allocation Method for Heterogeneous Formation Observation Satellites Based on Potential Games

Xuan Lyu	Nanjing University of Aeronautics and Astronautics
Yajie Ma	Nanjing University of Aeronautics and Astronautics
Bin Jiang	Nanjing University of Aeronautics and Astronautics
Chengrui Liu	Beijing Institute of Control Engineering
Wenbo Li	Beijing Institute of Control Engineering
Yaowei Bian	Nanjing University of Aeronautics and Astronautics

●Oral-02 16:15-16:30

[0150] HCDFL with Information Optimization for Satellite Formation Fault Diagnosis

Xinyue Du	Tianjin University
Xiuyun Zhang	Tianjin University
Da Liu	Tianjin University
Wenjing Liu	Beijing Institute of Control Engineering
Qun Zong	Tianjin University

●Oral-03 16:30-16:45

[0358] Life Estimation of Generalized Nonlinear Accelerated Degradation Process on Potential Games

Pengjun Zeng	Beihang University
Zhihua Wang	Beihang University

●Oral-04 16:45-17:00

[0415] An Anomaly Detection Approach for Aerospace Telemetry Data Based on Model-Agnostic Meta-Learning

Jiaxi Li	Chongqing University
Xiaolei Tang	Chongqing University
Wenbo Li	Beijing Institute of Control Engineering
Chengrui Liu	Beijing Institute of Control Engineering
Huibo Zhang	Harbin Engineering University
Qie Liu	Chongqing University

●Oral-05 17:00-17:15

[0419] A Fault Diagnosis Method Based on Dual-Layer Adaptive Personalized Federated Learning in Wind Turbines

Xinlei Kan	University of Science and Technology Beijing
Xinghao Chen	University of Science and Technology Beijing
Linlin Li	University of Science and Technology Beijing
Xin Peng	East China University of Science and Technology
Maiying Zhong	Shandong University of Science and Technology

●Oral-06 17:15-17:30

[0517] LiST-CFD: Lightweight Spatio-Temporal Convolutional Fault Detection for Spacecraft

Jingtong Zhao	Beijing University of Posts and Telecommunications
Siye Wang	Beijing University of Posts and Telecommunications
Shuhui Li	Beijing University of Posts and Telecommunications
Peizhan Qin	Beijing University of Posts and Telecommunications
Chengrui Liu	Beijing Institute of Control Engineering

●Oral-07 17:30-17:45

[0539] Hybrid GAIN-Based Spacecraft Anomaly Detection Via Reconstruction of Randomly Missing Data

Pengyi Wang	National University of Defense Technology
Juhui Wei	National University of Defense Technology
Xuanying Zhou	National University of Defense Technology
Zhangming He	National University of Defense Technology
Jiongqi Wang	National University of Defense Technology

●Oral-08 17:45-18:00

[0586] Online Rocket Telemetry Anomaly Detection Based on Integrated LSTM Model

Fuke Wang	National University of Defense Technology
Jiongqi Wang	National University of Defense Technology
Juhui Wei	National University of Defense Technology

Pengyi Wang	National University of Defense Technology
Zhangming He	National University of Defense Technology

Parallel Session 15

Parallel Session 15-S1	Aug 4, Monday, 14:00-16:00
Oral Session 15-S1	Meeting Room

Mon-R.15 S1: Advanced Control of Large-Scale and Distributed Space Structures

Chair: Xiaoxiang Liu	Beijing Institute of Control Engineering
Chair: Xiao Feng	Beijing Institute of Control Engineering

●Oral-01 14:00-14:15

[0343] Distributed Model Predictive Control for Multi-Satellite Cooperative Encirclement

Ming Yang	Sichuan University
Bin Li	Sichuan University
Mingming Shi	Sichuan University

●Oral-02 14:15-14:30

[0511] A Dual-Loop Distributed Control Method for Large-Scale Fully Flexible Spacecraft

Zhicheng Ning	China Academy of Space Technology
Yingzi He	Beijing Institute of Control Engineering
Xiaoxiang Liu	Beijing Institute of Control Engineering
Yi Li	Beijing Institute of Control Engineering
Xiao Feng	Beijing Institute of Control Engineering
Xin Guan	Beijing Institute of Control Engineering

●Oral-03 14:30-14:45

[0473] MARL Control of On-Orbit Peg-in-Hole Assembly in Macro-Micro Robots

Hao Li	Beijing Institute of Technology
Xuchao Huang	Beijing Institute of Technology
Yibo Zhang	China University of Mining and Technology (Beijing)
Quan An	Beijing Institute of Technology
Yao Zhang	Beijing Institute of Technology

●Oral-04 14:45-15:00

[0281] Reduced-Order Modeling for Rigid-Flexible Coupling Dynamics of Large-Scale Space Structures with Large Deformations

Yang An	Tsinghua University
Tianshu Wang	Tsinghua University
Zhan Mu	Tsinghua University

●Oral-05 15:00-15:15

[0521] Attitude Control of Spacecraft with Rotational Dynamic Inertia: MPC for a Three-Ring Architecture

Sajjad Hossain Masum	Beihang University

●Oral-06 15:15-15:30

[0522] Modeling and Distributed Control of Large Space Structure

Xiao Feng	Beijing Institute of Control Engineering
Xin Guan	Beijing Institute of Control Engineering
Yi Li	Beijing Institute of Control Engineering

Xiaoxiang Liu — Beijing Institute of Control Engineering
Zhicheng Ning — China Academy of Space Technology

Parallel Session 15-S2	Aug 4, Monday, 16:00-18:00
Oral Session 15-S2	Meeting Room

Mon-R.15 S2: Applications of Machine Learning in Rendezvous and Docking as well as Space Operations
Chair: Yongchun Xie — Beijing Institute of Control Engineering
Chair: Yong Wang — Beijing Institute of Control Engineering
Chair: Yifei Wu — Nanjing University of Science and Technology

●Oral-01 16:00-16:15

0418 Task Allocation Framework using Task-Decomposition-Matrix and LLMs for Multi-Robot Collaborative Assembly
Congwei Zhang — Academy of Mathematics and Systems Science, Chinese Academy of Sciences
Mengyang Wang — Academy of Mathematics and Systems Science, Chinese Academy of Sciences
Hongsheng Qi — Academy of Mathematics and Systems Science, Chinese Academy of Sciences
Yi Huang — Academy of Mathematics and Systems Science, Chinese Academy of Sciences

●Oral-02 16:15-16:30

0466 Predefined-Time Event-Triggered Cooperative Control for Distributed Spacecraft Formations
Jiaming Liu — Nanjing University of Science and Technology
Zhanpeng Feng — Nanjing University of Science and Technology
Yifei Wu — Nanjing University of Science and Technology

●Oral-03 16:30-16:45

0542 Multi-Agent Task Planning under Temporal Logic Constraints: A Conflict-Resolution Approach
Chenzhi Zhao — Academy of Mathematics and Systems Science, Chinese Academy of Sciences
Yi Huang — Academy of Mathematics and Systems Science, Chinese Academy of Sciences
Hongsheng Qi — Academy of Mathematics and Systems Science, Chinese Academy of Sciences

●Oral-04 16:45-17:00

0572 An Optimization Method for On-Orbit Spacecraft Module Replacement Based on Comprehensive Indicator Evaluation
Jiajia Feng — Beijing Institute of Control Engineering

●Oral-05 17:00-17:15

0590 Space Solar Energy Collection Using CubeSat with Reflective Surfaces
Pavel Klykov — Shanghai Jiao Tong University
Wei Wang — Shanghai Jiao Tong University
Ziyao Geng — Shanghai Jiao Tong University
Shufan Wu — Shanghai Jiao Tong University

●Oral-06 17:15-17:30

0454 Applications of Machine Learning in Rendezvous and Docking as well as Space Operations
Yong Wang — Beijing Institute of Control Engineering
Pu Yang — Zhejiang Sci-Tech University
Haidong Hu — Beijing Institute of Control Engineering
Yongchun Xie — Beijing Institute of Control Engineering

●Oral-07 17:30-17:45

0145 Efficient Hand Pose Estimation Using Transformer-Based Backbone and Multi-Scale Interactions

Hao Chen	Chongqing University of Posts and Telecommunications
Yong Wang	Beijing Institute of Control Engineering
Yongchun Xie	Beijing Institute of Control Engineering
Chenqiang Gao	Shenzhen Campus of Sun Yat-sen University

●Oral-08 17:45-18:00

[0581] Distance-Constrained Two-Pulse Rendezvous Optimization Using Adaptive Genetic Algorithms

Zidi Li	Harbin Institute of Technology
Peng Guo	Harbin Institute of Technology
Yuxuan Wang	Harbin Institute of Technology
Yuqing Li	Harbin Institute of Technology

Parallel Session 16

Parallel Session 16-S1 — Aug 4, Monday, 14:00-16:00
Oral Session 16-S1 — Grand Ballroom 2

Mon-R.16 S1: Spacecraft Collision Threat Prediction and Autonomous Avoidance Control

Chair: Min Li	Beijing Institute of Control Engineering
Chair: Tiantian Jiang	Beijing Institute of Control Engineering
Chair: Yuan Huang	Beijing Institute of Control Engineering

●Oral-01 14:00-14:15

[0568] Research on Fault Early Warning Method of Control Torque Gyroscope Based on Support Vector Data Description

Cheng Li	Harbin Institute of Technology
Yunjia Dong	Harbin Institute of Technology
Huan Yang	Beijing Institute of Tracking and Telecommunications Technology
Mingjia Lei	Harbin Institute of Technology
Xiaoen Feng	Harbin Institute of Technology
Yuqing Li	Harbin Institute of Technology

●Oral-02 14:15-14:30

[0452] Research on Strategy Generation for Orbital Games with Variable Decision Cycles

Chengzi Guan	Beijing Institute of Technology
Yao Zhang	Beijing Institute of Technology
Hongbo Wang	Beijing Institute of Technology
Shuya Tang	Beijing Institute of Technology
Yazhou Yang	Beijing Institute of Technology
Shihao Feng	Beijing Institute of Technology

●Oral-03 14:30-14:45

[0304] Intention Recognition of Non-Cooperative Space Targets Based on GMM-HMM

Yiyun Zhang	Beihang University
Pengfei Lu	Beihang University
Yue Wang	Beihang University

●Oral-04 14:45-15:00

[0249] Attitude-Orbit Integrated Control for Flexible Spacecraft in Rendezvous and Docking

Boyuan Yang	Xi'an Jiaotong University
Chenxi Wang	Xi'an Jiaotong University
Zhi Zhai	Xi'an Jiaotong University
Zhaoyong Wang	Xi'an Jiaotong University

Xin Wang — Xi'an Jiaotong University
Jinxin Liu — Xi'an Jiaotong University

●Oral-05 15:00-15:15

0569 Optimizing Regional Navigation Constellation under Complex Perturbations

Zhijun Que — Beijing Institute of Technology
Fei Han — Shandong Institute of Space Electronic Technology
Tao Nie — Beijing Institute of Technology

●Oral-06 15:15-15:30

0472 Optimal Control-Based Game Strategy for Intercepting Orbital Threat

Yuanshi Liu — Harbin Institute of Technology
Jiaming Yang — Harbin Institute of Technology
Yipeng Zhu — Harbin Institute of Technology
Chenhui Qin — Harbin Institute of Technology
Jianbin Qiu — Harbin Institute of Technology

●Oral-07 15:30-15:45

0359 Research on Grasping and Transferring Floating Objects by Space Robots Using Combined Imitation-Reinforcement Learning

Mingyang Li — Beijing Institute of Control Engineering
Yuan Huang — Beijing Institute of Control Engineering
Haibo Zhang — Beijing Institute of Control Engineering
Shuanfeng Xu — Beijing Institute of Control Engineering
Han Sun — Shanghai Jiao Tong University
Nailong Liu — Beijing Institute of Control Engineering
Jingyi Zhou — Beijing Institute of Control Engineering
Xiaorui Zhang — Beijing Institute of Control Engineering

Parallel Session 16-S2 — Aug 4, Monday, 16:00-18:00
Oral Session 16-S2 — Grand Ballroom 2

Mon-R.16 S2: Space Situation Awareness

Chair: Liang Tang — Beijing Institute of Control Engineering
Chair: Rui Zhong — Beihang University
Chair: Yuying Liang — Beihang University
Chair: Mingpei Lin — Tohoku University

●Oral-01 16:00-16:15

0380 Trajectory Optimization of the GEO Target Observation Mission Using the Parent-Child Spacecraft System

Ji Ye — Beijing Institute of Technology
Yao Zhang — Beijing Institute of Technology
Siliang Yang — Deep Space Exploration Lab

●Oral-02 16:15-16:30

0530 Swarm-based Cooperative Coverage Strategy for Amphibious Unmanned Systems in Complex Wetland Environments

Yuhang He — Northwestern Polytechnical University
Bo Liao — Shanghai Institute of Satellite Engineering
Qingqing Dang — Northwestern Polytechnical University

●Oral-03 16:30-16:45

[0325] Cislunar Space Situational Awareness via Earth-Moon Resonant Orbits

Ying Ding — Beijing Institute of Technology
Yi Qi — Beijing Institute of Technology
Dong Qiao — Beijing Institute of Technology

●Oral-04 16:45-17:00

[0235] Trajectory Optimization of Rapid Space Debris Capture Based on Reinforcement Learning

He Ren — Beihang University
Haichao Gui — Beihang University
Rui Zhong — Beihang University

●Oral-05 17:00-17:15

[0315] Predicting Internal Structure of Vesta by Flight States of Dawn Spacecraft via Data-driven Approach: Part I

Yuying Liang — Beihang University

●Oral-06 17:15-17:30

[0548] Research Progress of Space Inertial Sensor Control Technology

Shufan Wu — Shanghai Jiao Tong University
Qianyun Zhang — Shanghai Jiao Tong University
Xiaoyun Sun — Shanghai Jiao Tong University
Yu Xiang — Shanghai Jiao Tong University

Parallel Session 17

Parallel Session 17 — Aug 4, Monday, 14:00-18:00
Oral Session 17 — Grand Ballroom 3

Mon-R.17 Advanced Control and Information Fusion Technology for Aerospace Applications

Chair: Xiang Yu — Beihang University
Chair: Yulong Huang — Harbin Engineering University
Chair: Shuai Yuan — Harbin Institute of Technology

●Oral-01 14:00-14:15

[0561] Covariance Switch-Based Kalman Filter with Slow Propagation: Analysis and Applications

Jiale Han — Shanghai Jiao Tong University
Tong Hua — Shanghai Jiao Tong University
Jiazi Gao — Beijing Jiao Tong University
Ouyang Wei — Tongji University

●Oral-02 14:15-14:30

[0311] Analysis of the Impact of Multi-Source Heterogeneous Sensing on the Autonomous Decision-Making Performance of Naval Gun Systems

Jing Wang — Northwest Institute of Mechanical & Electrical Engineering
Baorong Liu — Northwest Institute of Mechanical & Electrical Engineering
Yue Zhang — Northwest Institute of Mechanical & Electrical Engineering
Lin Zhang — Northwest Institute of Mechanical & Electrical Engineering
Dingheng Wang — Northwest Institute of Mechanical & Electrical Engineering

●Oral-03 14:30-14:45

[0081] Online Incremental Identification and Offline Intelligent Correction of AHV Aerodynamic Model

Shuaibin An — Dalian University of Technology

Honglin Liu	Dalian University of Technology
Guan Wang	Dalian University of Technology
Kai Liu	Dalian University of Technology

●Oral-04 14:45-15:00

0002 Performance Analysis of LOS Rate Estimation Against A Maneuvering Fighter Target

Ruihao Cao	Beijing Institute of Technology
Hua Xiong	Beijing Institute of Electronic System Engineering
Shaoming He	Beijing Institute of Technology

●Oral-05 15:00-15:15

0107 Bio-Inspired Enhanced Underwater Dead Reckoning Solution Via IMU/Polarization/DVL Integration

Teng Zhang	Beihang University
Xinjing Shen	Beihang University
Wenshuo Li	Beihang University
Jian Yang	Beihang University
Jianzhong Qiao	Beihang University
Xiang Yu	Beihang University

●Oral-06 15:15-15:30

0541 A Multi-view Landmark Representation Approach with Application to GNSS-Visual-Inertial Odometry

Tong Hua	Shanghai Jiao Tong University
Jiale Han	Shanghai Jiao Tong University
Ouyang Wei	Tongji University

●Oral-07 15:30-15:45

0200 A Relative Navigation Integrity Monitoring Algorithm for UAV Swarm

Jinglei Li	Harbin Engineering University
Jiayu Yan	Harbin Engineering University
Jiashuo Li	Harbin Engineering University
Yulong Huang	Harbin Engineering University

●Oral-08 16:00-16:15

0122 Robust Single-Stage Visual Servoing with Kinematic and Dynamic Uncertainties

Kaiyue Xing	Southeast University
Xiao Min	Southeast University
Simone Baldi	Southeast University

●Oral-09 16:15-16:30

0312 Airflow Angle Estimation Using an Observable Decomposition based Schmidt-Kalman Filter

Jiaoyang Kou	Huazhong University of Science and Technology
Hongtao Liu	COMAC Shanghai Aircraft Design & Research Institute
Yu Liu	COMAC Shanghai Aircraft Design & Research Institute
Lei Liu	Huazhong University of Science and Technology
Yiming Wan	Huazhong University of Science and Technology

●Oral-10 16:30-16:45

0319 Accelerating for Trajectory Generation in Spacecraft Proximity via MLP-LSTM Network

Shengze Yuan	Harbin Institute of Technology
Hanxin Zhang	Harbin Institute of Technology

Zhicheng Zhou	Harbin Institute of Technology
Shuai Yuan	Harbin Institute of Technology

●Oral-11 16:45-17:00

0391 ETSEnet: Efficient Transformer with Squeeze and Excitation for Turbofan Engine Life Prediction

Mengzhi Zhao	Beihang University
Cun Shi	Beihang University
Shaoping Wang	Beihang University
Di Liu	Beihang University

●Oral-12 17:00-17:15

0348 3D Guidance Law against Maneuvering Target with Time and Angle Constraints

Yuxiang He	Harbin Institute of Technology
Fengyu Guo	Beijing Institute of Astronautical Systems Engineering
Hao Zhang	Harbin Institute of Technology
Kemao Ma	Harbin Institute of Technology

●Oral-13 17:15-17:30

0486 Predictive Modeling of CMG Degradation in Satellites: A Data-Driven Approach

Hira Ambreen	Beihang University
Muhammad Imran	Henan University
MD Monjur A Alahi Atib	Beihang University
Diyin Tang	Beihang University

●Oral-14 17:30-17:45

0279 Drive Error Compensation Method for Frequency Modulation Hemispherical Resonator Gyro

Zeyuan Guan	Harbin Institute of Technology
Zhennan Wei	Harbin Institute of Technology
Ning Wang	Harbin Institute of Technology
Guoxing Yi	Harbin Institute of Technology
Hongbo Wu	Harbin Institute of Technology
Yiwei Sun	Harbin Institute of Technology

●Oral-15 17:45-18:00

0121 An Identification and Elimination Strategy for Disturbance Moment and Force in Full-Physical Simulation

Zhicheng Yuan	Shanghai Jiao Tong University
Jun He	Shanghai Jiao Tong University
Xianxing Shen	Shanghai Jiao Tong University

Parallel Session 18

Parallel Session 18	Aug 5, Tuesday, 08:30-12:00
Oral Session 18	Function Room 1

Tue-R.18 Autonomous Navigation and Control of Deep Space Probes

Chair: Xiangyu Huang	Beijing Institute of Control Engineering
Chair: Kai Xiong	Beijing Institute of Control Engineering
Chair: Yang Tian	Harbin Institute of Technology
Chair: Wei Shao	Qingdao University of Science and Technology

●Oral-01 08:30-08:45

0374 A Robust Orbit Determination Algorithm for Space-Based Optical Observations in Complex Environments

Yi Guan	Beijing Institute of Technology
Shengying Zhu	Institute of Deep Space Exploration

●Oral-02 08:45-09:00

[0420] Cross-Scale Fast Images Matching Algorithm for Mars Landing

Yunhao Yang	Qingdao University of Science and Technology
Mingda Jin	Qingdao University of Science and Technology
Wei Guo	Qingdao University of Science and Technology
Xizhen Gao	Beijing Institute of Control Engineering
Wei Shao	Qingdao University of Science and Technology

●Oral-03 09:00-09:15

[0421] Illumination-Invariant Scale View Match: Transformer Feature Matching for Mars Landing

Hua Pan	Qingdao University of Science and Technology
Mingda Jin	Qingdao University of Science and Technology
Wei Guo	Qingdao University of Science and Technology
Xiangyu Huang	Beijing Institute of Control Engineering
Wei Shao	Qingdao University of Science and Technology

●Oral-04 09:15-09:30

[0425] High-Precision Mars Landing Navigation Method Based on Multimodal Attention and Adaptive Decision Mechanism

Shihang Liu	Qingdao University of Science and Technology
Mingda Jin	Qingdao University of Science and Technology
Wei Guo	Qingdao University of Science and Technology
Xiangyu Huang	Beijing Institute of Control Engineering
Wei Shao	Qingdao University of Science and Technology

●Oral-05 09:30-09:45

[0433] Coupled Position-Attitude Control for Spacecraft Rendezvous Final Approach under Path Constraint

Qihai Fang	Harbin Institute of Technology
Beining Sheng	Harbin Institute of Technology
Hutao Cui	Harbin Institute of Technology

●Oral-06 09:45-10:00

[0446] Attitude Control for Space Probes Via Fully Actuated System Theory and Adaptive Iterative Learning

Fei Ye	Sun Yat-sen University
Fangzhou Fu	Sun Yat-sen University
Huijie Sun	Sun Yat-sen University

●Oral-07 10:15-10:30

[0491] Intelligent Trajectory Planning Method for Small Celestial Body Cooperative Exploration

Bozhong Xiang	Beijing Institute of Technology
Dantong Ge	Beijing Institute of Technology
Shengying Zhu	Beijing Institute of Technology

●Oral-08 10:30-10:45

[0510] Cooperative Navigation and Landmark Set Construction Method for Multi-Spacecraft Orbital Exploration of Small Bodies

Yilin Cao	Beijing Institute of Technology

Xizhen Gao — Beijing Institute of Control Engineering
Shengying Zhu — Beijing Institute of Technology

●Oral-09 10:45-11:00

[0328] Alignment Calibration for Spacecraft Landmark-Based Navigation System
Kai Xiong — Beijing Institute of Control Engineering
Xiangyu Huang — Beijing Institute of Control Engineering

●Oral-10 11:00-11:15

[0558] Robust Optimal Sliding Mode Control for Coulomb Formation Reconfiguration
Xiao Pan — Shanghai Institute of Spaceflight Control Technology
Peerawat Artitthang — Beihang University
Mingpei Lin — Tohoku University

●Oral-11 11:15-11:30

[0556] Stationkeeping Strategy of Quasi-halo Orbits Based on Coupling-induced Bifurcation Computation
Haozhe Shu — Tohoku University
Mingpei Lin — Tohoku University

●Oral-12 11:30-11:45

[0414] A Domain Randomization-Based Multimodal Perception Method for Spacecraft
Hang Du — Beijing Institute of Control Engineering
Huida Yan — Harbin Institute of Technology
Xiangyu Huang — Beijing Institute of Control Engineering

●Oral-13 11:45-12:00

[0274] A Convex Optimization-Based 6-DoF Guidance Method for Lunar Powered Descent
Chenhui Li — Kyushu University
Mai Bando — Kyushu University
Shinji Hokamoto — Kyushu University

Parallel Session 19

Parallel Session 19 — Aug 5, Tuesday, 08:30-12:00
Oral Session 19 — Function Room 2

Tue-R.019 Aircraft Dynamics, Navigation, Guidance and Control
Chair: Guilherme Vianna Raffo — Federal University of Minas Gerais
Chair: Yuandong Ji — Sichuan University

●Oral-01 08:30-08:45

[0014] Finite-Time Super-Twisting Adaptive Control for Combined Aircraft
Lixin Liu — Huazhong University of Science and Technology
Huijin Fan — Huazhong University of Science and Technology
Lei Liu — Huazhong University of Science and Technology
Bo Wang — Huazhong University of Science and Technology

●Oral-02 08:45-09:00

[0547] A Multi-Layer MPC Scheme for Autonomous UAV Navigation in Constrained Environments
Joao Pedro Lemos Morais — Federal University of Minas Gerais
Luciano Pimenta — Universidade Federal de Minas Gerais

Marcelo Alves Santos	University of Bergamo
Guilherme Vianna Raffo	Federal University of Minas Gerais

●Oral-03 09:00-09:15

[0500] Multiple UAV Coordination for Enhanced Search and Rescue Missions

Marcelo Alves Santos	University of Bergamo
Richard Andrade Alfaro	Federal University of Minas Gerais
Mario Benjamín Rosa	Zelenza Soluciones Integrales S.A.
Julián Delgado	Zelenza Soluciones Integrales S.A.
Guilherme Vianna Raffo	Federal University of Minas Gerais
Sergio Esteban	Universidad de Sevilla

●Oral-04 09:15-09:30

[0538] An Adaptive Approach to Multi-Agent Coordination: Leveraging Supervisory Control Theory and MPC for Real-Time Scheduling

Matheus Paiva Loures	Universidade Federal de Minas Gerais
Marcelo Alves Santos	University of Bergamo
Luciano Pimenta	Universidade Federal de Minas Gerais
Patricia Nascimento Pena	Universidade Federal de Minas Gerais
Guilherme Vianna Raffo	Universidade Federal de Minas Gerais

●Oral-05 09:30-09:45

[0161] Adaptive Predefined-Time Fault-Tolerant Attitude Tracking Control for Aircraft with Actuator Fault

Huiyunuo Xiao	Huazhong University of Science and Technology
Huijin Fan	Huazhong University of Science and Technology
Lei Liu	Huazhong University of Science and Technology
Bo Wang	Huazhong University of Science and Technology

●Oral-06 09:45-10:00

[0540] Motion-Stimulus Requirements for VIF-Based In-Flight Alignment Across Four IMU Grades

Kyeongeun Lee	Seoul National University
Chan Gook Park	Seoul National University

●Oral-07 10:15-10:30

[0151] A Hindsight Reward Function for Reinforcement Learning-Based Worst-Case Analysis of Flight Control Laws

David Braun	Technical University of Munich, Institute of Flight System Dynamics
Florian Holzapfel	Technical University of Munich
Patrick Piprek	Airbus Defence and Space GmbH

●Oral-08 10:30-10:45

[0191] Observer-Structured Flight Controller Converted from PID-Based Flight Controller Using Actually Obtained Data

Toshiaki Kuwahata	Kumamoto University
Masayuki Sato	Kumamoto University

●Oral-09 10:45-11:00

[0154] Surrogate-Assisted Feasibility Estimation of Flight Control Parameters: A Post-Optimization Approach

Cedric Kotitschke	Technical University of Munich
David Braun	Technical University of Munich, Institute of Flight System Dynamics
Florian Holzapfel	Technical University of Munich

●Oral-10 11:00-11:15

[0061] Predefined-Time Backstepping Sliding Mode Control for Tilt-Rotor Quadcopter UAV

Quanli Zeng	Huazhong University of Science and Technology
Lei Liu	Huazhong University of Science and Technology
Huijin Fan	Huazhong University of Science and Technology
Bo Wang	Huazhong University of Science and Technology
Fangzheng Zhou	Huazhong University of Science and Technology

●Oral-11 11:15-11:30

[0143] Characteristics of Lower Stratospheric Wind Fields at Baotou Test Site Using ERA5 Reanalysis Data and Their Effects on Low-Dynamic Vehicles

Chenning Zhang	Aerospace Times Feihong Technology Co., Ltd.
Apeng Dong	Aerospace Times Feihong Technology Co., Ltd.
Qite Wang	Aerospace Times Feihong Technology Co., Ltd.
Yalou Bu	Aerospace Times Feihong Technology Co., Ltd.
Qian Guo	China Electronics Technology Group Corporation Avionics Co., Ltd.
Xiao Bai	Beihang University

●Oral-12 11:30-11:45

[0206] Data-Driven Task-Specific Optimization of H∞ Controllers via Bayesian Optimization

Marta Manzoni	Politecnico di Milano
Marco Lovera	Politecnico di Milano

●Oral-13 11:45-12:00

[0551] NMPC of a Quadtilt-rotor UAV for Fast Point-to-Point Motion Across the Full Flight Envelope

Aclécio de Jesus Santos	Federal University of Minas Gerais
Sergio Esteban	Universidad de Sevilla
Jean Pereira	Centro Federal de Educação Tecnológica de Minas Gerais - CEFET
Guilherme Vianna Raffo	Federal University of Minas Gerais

Parallel Session 20

Parallel Session 20	Aug 5, Tuesday, 08:30-12:00
Oral Session 20	Function Room 3

Tue-R.20 Resilient and Cooperative Guidance and Control of Aerial Vehicles

Chair: Shufan Wu	Shanghai Jiao Tong University
Chair: Ban Wang	Northwestern Polytechnical University
Chair: Xianghong Xue	Xi'an University of Technology

●Oral-01 08:30-08:45

[0155] Cooperative Formation and Attack Control for Multiple Fixed-Wing UAVs

Jianghang Ge	Northwestern Polytechnical University
Ban Wang	Northwestern Polytechnical University
Zhenghong Gao	Northwestern Polytechnical University

●Oral-02 08:45-09:00

[0589] Predefined Time Formation Tracking Control of High-Order Networked Agent Systems Subject to External Disturbances

Chenglin Han	University of Electronic Science and Technology of China
Hongying Zhang	University of Electronic Science and Technology of China
Boxian Lin	University of Electronic Science and Technology of China
Bowen Chen	University of Electronic Science and Technology of China
Mengji Shi	University of Electronic Science and Technology of China
Kaiyu Qin	University of Electronic Science and Technology of China

●Oral-03 09:00-09:15

0124 Event-Triggered Formation Control of Fixed-Wing UAVs with Switching Topologies and Velocity Constraints

Mengmeng Jun	Huazhong University of Science and Technology
Huijin Fan	Huazhong University of Science and Technology
Lei Liu	Huazhong University of Science and Technology
Bo Wang	Huazhong University of Science and Technology

●Oral-04 09:15-09:30

0153 Cooperative Formation Control for Multi-UAV Systems Using a Leader-Follower Strategy

Qi Yang	Northwestern Polytechnical University
Ban Wang	Northwestern Polytechnical University
Lingxia Mu	Xi'an University of Technology
Xianghong Xue	Xi'an University of Technology

●Oral-05 09:30-09:45

0506 Hierarchical Decision-Making Mechanism for UAV Formation Reconfiguration Via Stackelberg Game

Hongxu Zhu	Shanghai Jiao Tong University
Wei Wang	Shanghai Jiao Tong University
Shufan Wu	Shanghai Jiao Tong University

●Oral-06 09:45-10:00

0372 Design of Cooperative Guidance Laws for Aircraft Formation Based on Fixed-Time Stability Theory

Ji Zhang	Shanghai Electro-Mechanical Engineering Institute
Dongjing Xing	Shanghai Satellite Engineering Institute
Bowen Yang	Shanghai Electro-Mechanical Engineering Institute
Cunfeng Gu	Shanghai Electro-Mechanical Engineering Institute

●Oral-07 10:15-10:30

0083 A Forest Fire Detection Method by a Modified YOLOv8 Algorithm with Feature Alignment and Fusion Strategy

Yichi Yang	Xi'an University of Technology
Lingxia Mu	Xi'an University of Technology
Youmin Zhang	Concordia University
Ziqi Zhai	Xi'an University of Technology
Xianghong Xue	Xi'an University of Technology

●Oral-08 10:30-10:45

0128 Tail-Propeller Assisted UAV Perching Control System Design & Verification

Roberto Carlos Farinango Limaico	University of Leeds
Jongrae Kim	University of Leeds
Bilal Kaddouh	University of Leeds

●Oral-09 10:45-11:00

0298 Aggressive Perching Trajectory Planning and Control for Quadrotor

Mosha Gong Northwestern Polytechnical University
Zhuang Shao Northwestern Polytechnical University
Baiyang Li Northwestern Polytechnical University
Junjie Wang Aviation College Northwestern Polytechnical University
Yuan Wang Harbin Institute of Technology

●Oral-10 11:00-11:15

0114 UAV Obstacle Avoidance Algorithm Based on Model Predictive Control and Control Barrier Functions

Deng Wang Xi'an University of Technology
Lingxia Mu Xi'an University of Technology
Ban Wang Northwestern Polytechnical University
Qingliang Li Xi'an University of Technology
Xianghong Xue Xi'an University of Technology

●Oral-11 11:15-11:30

0134 Air-Ground Cooperative Guidance and Control Strategy for Autonomous Landing of a VTOL UAV on a Mobile Platform

Yifang Fu Northwestern Polytechnical University
Yongze Li Northwestern Polytechnical University
Ban Wang Northwestern Polytechnical University
Lingxia Mu Xi'an University of Technology
Hongwei Li AVIC Xi'an Aircraft Industry Group Company Ltd.

●Oral-12 11:30-11:45

0135 Adaptive Transition Flight Control for a Multi-Mode VTOL UAV with Model Uncertainties and Actuator Faults

Mengqi Zhou Northwestern Polytechnical University
Ban Wang Northwestern Polytechnical University
Huimin Zhao Northwestern Polytechnical University
Yifang Fu Northwestern Polytechnical University

●Oral-13 11:45-12:00

0117 Multi-UAVs Cooperative Reconnaissance Task Planning with Prior Position Information

Zhiqiang Han Sichuan University
Lei Hu Sichuan Aerospace System Engineering Research Institute
Qunxing Zhang The Third Military Representative Office of the Army Stationed in Chengdu
Zhenpeng Wang Sichuan Aerospace System Engineering Research Institute
Qi Jiang Sichuan Aerospace System Engineering Research Institute
Mingxin Yin Sichuan Aerospace System Engineering Research Institute

Parallel Session 21

Parallel Session 21 Aug 5, Tuesday, 08:30-12:00
Oral Session 21 Meeting Room

Tue-R.21 Artificial Intelligence-Based Attitude-Orbit Control for Multiple Spacecraft Systems

Chair: Ming Liu Harbin Institute of Technology
Chair: Bing Xiao Northwestern Polytechnical University
Chair: Shi Qiu Harbin Institute of Technology

●Oral-01 08:30-08:45

0082 A Monocular Vision-Based Algorithm for Spacecraft Pose Estimation

Ziyi He Harbin Institute of Technology
Feng Zhan Harbin Institute of Technology

Jian Chen — Harbin Institute of Technology
Ruichen Xi — Harbin Institute of Technology

●Oral-02 08:45-09:00

0423 Ddiom: Differentiated Dependency Modeling for Time Series Forecasting via Multiscale Individualized Channel-wise Operation and Global Feature Mapping

Chunshan Dong — Harbin Institute of Technology
Hengrui Li — Harbin Institute of Technology
Yifeng Wang — Harbin Institute of Technology
Yongbing Zhang — Harbin Institute of Technology
Shaohui Liu — Harbin Institute of Technology

●Oral-03 09:00-09:15

0104 State Estimation for Fuzzy Affine Multi-Rate Complex Networks with Energy Harvesting Constraints

Zehao Li — Harbin University of Science and Technology
Jun Hu — Harbin University of Science and Technology
Ruozi Sun — Harbin University of Science and Technology
Wanjiang Zhang — Harbin University of Science and Technology

●Oral-04 09:15-09:30

0474 Cubature Kalman Fusion Filtering for Nonlinear Rectangular Descriptor Systems against Deception Attacks

Ruonan Luo — Harbin University of Science and Technology
Jun Hu — Harbin University of Science and Technology
Zhaozhao Zhou — Harbin University of Science and Technology
Qiushi Feng — Harbin University of Science and Technology

●Oral-05 09:30-09:45

0079 Two-Stage Cubature Kalman Filter Based on Maximum Correntropy Criterion for Satellite State and Bias Estimation

Boyu Yang — Harbin Institute of Technology
Feng Zhan — Harbin Institute of Technology
Xueqin Chen — Harbin Institute of Technology

●Oral-06 09:45-10:00

0422 Huber-Based Two-Stage Unscented Kalman Filter for Satellite Fault Estimation with Non-Gaussian Measurement Noise

Feng Zhan — Harbin Institute of Technology
Boyu Yang — Harbin Institute of Technology
Yunhai Geng — Harbin Institute of Technology

●Oral-07 10:15-10:30

0189 KAN-GAN: Awaring Continuity and Frequency for Inertial Signal Super-Resolution

Yifeng Wang — Harbin Institute of Technology
Ruixin Chen — Hong Kong Polytechnic University
Yi Zhao — Harbin Institute of Technology

●Oral-08 10:30-10:45

0378 Wavelet Fusion Network for Signal Denoising

Haoxi Shangguan — Sichuan University
Xianchao Guan — Harbin Institute of Technology
Hengrui Li — Harbin Institute of Technology

Miaorun Lin	The University of Hong Kong
Yongbing Zhang	Harbin Institute of Technology
Yifeng Wang	Harbin Institute of Technology

●Oral-09 10:45-11:00

0003 Relative Navigation Design of Formation Flying Satellite in Large Elliptical Orbit

Chunyang Liu	Shanghai Institute of Aerospace Control Technology
Jingmei Huang	Shanghai Institute of Aerospace Control Technology
Kaiyu Zhang	Shanghai Institute of Aerospace Control Technology

●Oral-10 11:00-11:15

0276 Model Reference Adaptive Method for Satellite Attitude Tracking Control

Deqing Liu	Shanghai Institute of Aerospace Control Technology
Xudong Li	Shanghai Institute of Aerospace Control Technology
Yanghao Lin	Shanghai Institute of Aerospace Control Technology
Chao Zhong	Shanghai Institute of Aerospace Control Technology

●Oral-11 11:15-11:30

0269 Predefined-Time Attitude Tracking Control for Spacecraft without Velocity Measurement

Xueyi Liu	Northwestern Polytechnical University
Xiwei Wu	The Hong Kong Polytechnic University
Shijie Zhao	Northwestern Polytechnical University
Bing Xiao	Northwestern Polytechnical University

●Oral-12 11:30-11:45

0366 MSFBF-TWT:A Multi-Scale Fusion-Based Framework for Traveling Wave Tubes RUL Prediction

Xingping Huang	Harbin Institute of Technology
Haotian Zhao	Harbin Institute of Technology
Ming Liu	Harbin Institute of Technology

Parallel Session 22

Parallel Session 22 — Aug 5, Tuesday, 08:30-12:00
Oral Session 22 — Grand Ballroom 2

Tue-R.22 FAS Theory and Applications in Aerospace Control

Chair: Bin Li	Sichuan University
Chair: Jinsheng Guo	Harbin Institute of Technology
Chair: Xiubo Wang	Northeastern University

●Oral-01 08:30-08:45

0168 Negative Imaginary Controller Design for Flexible Structures Based on Internal Model Control

Lianghao Su	Northeastern University at Qinhuangdao
Zhining Cheng	Harbin Institute of Technology
Ange Tong	Northeastern University at Qinhuangdao
Fanwei Meng	Northeastern University at Qinhuangdao

●Oral-02 08:45-09:00

0075 Prescribed-Time Observers-Based Control for Fully Actuated Systems With Mismatched Disturbances

Zhi Li	Harbin Institute of Technology, Shenzhen
Ying Zhang	Harbin Institute of Technology, Shenzhen

●Oral-03 09:00-09:15

[0102] GPIO-Based Tracking Control of Nonlinear Fully Actuated Systems with External Disturbances

Dawei Zhang — Southern University of Science and Technology
Guoping Liu — Southern University of Science and Technology

●Oral-04 09:15-09:30

[0497] Fault Compensation-based H∞ Fault Tolerant Tracking Control for Discrete-Time Fully Actuated Systems

Qunfu Zhou — Hainan University
Cheng Qian — Hainan University
Dawei Zhang — Southern University of Science and Technology

●Oral-05 09:30-09:45

[0062] Safe Control for VTOL UAV Based on FAS Approaches

Lixue Xu — Harbin Institute of Technology
Xiubo Wang — Northeastern University

●Oral-06 09:45-10:00

[0243] Impulsive Adaptive Dynamic Programming for Spacecraft Pose Tracking Control Based on Fully Actuated System Model

Xiaoxiang Zhang — Harbin Institute of Technology
Rongyu Jin — Beijing Institute of Control Engineering
Yunhai Geng — Harbin Institute of Technology

●Oral-07 10:15-10:30

[0559] Pseudo Predictor-Based Fully Actuated System Approach for Trajectory Tracking of Space Manipulators with a Constant Input Delay

Xujie Zhang — Southern University of Science and Technology
Jinpeng Fan — Southern University of Science and Technology
Guangren Duan — Harbin Institute of Technology
Guangtai Tian — Sichuan University

●Oral-08 10:30-10:45

[0305] Model Reference Tracking Control of Time-Delay Discrete-Time HOFA Systems and Application to a Class of Combined Spacecraft Simulator

Kaixin Cui — Taiyuan University of Technology
Hao Lu — Harbin Institute of Technology
Xinying Xu — Taiyuan University of Technology

●Oral-09 10:45-11:00

[0169] Non-Disturbance Payload Magnetic Levitation Satellite Attitude Maneuvering Control

Xiangjie li — Northeastern University at Qinhuangdao
Jiaxiang Xie — Northeastern University at Qinhuangdao
Min Wang — Northeastern University at Qinhuangdao
Zihao Yu — Northeastern University
Fanwei Meng — Northeastern University at Qinhuangdao

●Oral-10 11:00-11:15

[0263] Integrated Design for Communication and Control in UAV-Assisted Wireless Communications via Weight-Adjusted Deep Reinforcement Learning

Jian Kuang — Sichuan University

Bin Li	Sichuan University
Mingming Shi	Sichuan University
Chen Wei	Beijing University of Aeronautics and Astronautics
Guangren Duan	Harbin Institute of Technology

●Oral-11 11:15-11:30

0005 Shared Control for Spacecraft Close-Range Rendezvous and Docking under Output Constraints

Ke Tang	University of Science and Technology Beijing
Liang Sun	University of Science and Technology Beijing

●Oral-12 11:30-11:45

0085 Fixed-Time Attitude Control of Spacecraft Equipped with Multiple Two-Dimensional Turntables

Songjing Ma	Nanjing University of Aeronautics and Astronautics
Pengfei Zheng	Aerospace System Engineering Shanghai
Tianle Liu	Nanjing University of Aeronautics and Astronautics
Dian Wang	Nanjing University of Aeronautics and Astronautics
Yunhua Wu	Nanjing University of Aeronautics and Astronautics

Parallel Session 23

Parallel Session 23 — Aug 5, Tuesday, 08:30-12:00
Oral Session 23 — Grand Ballroom 3

Tue-R.23 Spacecraft Advanced Control for On-orbit Complex Missions

Chair: Dong Ye	Harbin Institute of Technology
Chair: Qiang Shen	Shanghai Jiao Tong University
Chair: Yan Xiao	Harbin Institute of Technology

●Oral-01 08:30-08:45

0215 Rapid Mission Planning for Agile Satellite Earth Observation

Cheng Wang	Harbin Institute of Technology
Sihan Wang	Institute of Aerospace System Engineering Shanghai
Yueyong Lyu	Harbin Institute of Technology
Pengyu Wang	Harbin Institute of Technology

●Oral-02 08:45-09:00

0296 Convex Mixed-Integer Model Predictive Control for Spacecraft Proximity Operations in J2-Perturbed Orbits with Thruster Constraints

Jiahao Yang	Harbin Institute of Technology
Dong Ye	Harbin Institute of Technology
Yan Xiao	Harbin Institute of Technology
Zhaowei Sun	Harbin Institute of Technology

●Oral-03 09:00-09:15

0338 A Goal-Oriented Reinforcement Learning-Based Path Planning Algorithm for Modular Self-Reconfigurable Satellites

Bofei Liu	Harbin Institute of Technology
Dong Ye	Harbin Institute of Technology
Zunhao Yao	Harbin Institute of Technology
Zhaowei Sun	Harbin Institute of Technology

●Oral-04 09:15-09:30

[0482] Optimization of Diagnostic Strategies for Multi-valued Systems Based on Information-heuristic Improved Particle Swarm Algorithm

Chao Man — Harbin Institute of Technology
Dong Ye — Harbin Institute of Technology
Yifan Liu — Harbin Institute of Technology

●Oral-05 09:30-09:45

[0228] A Simple Distributed Simultaneous Arrival Control Strategy for Multiple-to-one Spacecraft Pursuit evasion Games

Mingming Shi — Sichuan University
Pengfei Chen — Sichuan University
Shibo Chen — Sichuan University
Bin Li — Sichuan University
Dong Ye — Harbin Institute of Technology

●Oral-06 09:45-10:00

[0294] Finite-Time Attitude Control and Distributed Vibration Suppression for Gyroelastic Rigid-Flexible Coupled Satellites

Yan Yu — Harbin Institute of Technology
Jiang Shao — Harbin Institute of Technology
Yan Xiao — Harbin Institute of Technology
Dong Ye — Harbin Institute of Technology
Zhaowei Sun — Harbin Institute of Technology

●Oral-07 10:15-10:30

[0554] Error-exponential Prescribed-time Orbit Sliding Mode Containment

Xiaochuan Yu — Harbin Institute of Technology
Yanjun Yu — Harbin Institute of Technology
Wentao He — Harbin Institute of Technology
Huayi Li — Harbin Institute of Technology

●Oral-08 10:30-10:45

[0227] Event-Triggered Distributed Model Predictive Control for Spacecraft Formation with Collision Avoidance

Zeyang Zhao — Shanghai Jiao Tong University
Huiwen Zuo — Shanghai Jiao Tong University
Qiang Shen — Shanghai Jiao Tong University
Wei Wang — Shanghai Jiao Tong University

●Oral-09 10:45-11:00

[0010] Fault Diagnosis of ACS Based on the Self-Weighted Adaptive Locality Discriminant Projection Analysis Method

Changyong Shi — Shanghai Jiao Tong University
Yuke Zhang — Shanghai Institute of Spaceflight Control Technology
Xiang Wang — Shanghai Institute of Spaceflight Control Technology

●Oral-10 11:00-11:15

[0356] Low-Thrust Proximity Operation Design Via Terminal-Constraint Model Predictive Control

Longwei Xu — Harbin Institute of Technology
Shi Qiu — Harbin Institute of Technology

●Oral-11 11:15-11:30

[0443] Communication Link Failures in Multi-Spacecraft Systems on SO(3): Impact Analysis and Control

Yuhan Nie — Shanghai Jiao Tong University
Huiwen Zuo — Shanghai Jiao Tong University
Qiang Shen — Shanghai Jiao Tong University

●Oral-12 11:30-11:45

[0275] Fault-Tolerant Control of Spacecraft Attitude with Prescribed Performance

Haitao Bai — Harbin Institute of Technology
Feixiong Long — Harbin Institute of Technology
Ying Zhang — Harbin Institute of Technology

●Oral-13 11:45-12:00

[0133] Areostationary Mars Orbit: Dynamics, Control, and Applications

Matthieu Ferry — Beihang University
Yuying Liang — Beihang University

Parallel Session 24

Parallel Session 24 — Aug 5, Tuesday, 14:00-15:30
Oral Session 24 — Function Room 1

Tue-R.24: Advanced Safe Decision Making and Control for Aerospace Systems

Chair: Hao Yang — Nanjing University of Aeronautics and Astronautics
Chair: Zhenhua Wang — Harbin Institute of Technology
Chair: Jitao Li — Harbin Engineering University

●Oral-01 14:00-14:15

[0271] Hybrid Deep Reinforcement Learning for Real-Time Multi-Satellite Mission Planning under Dynamic Constraints

Haowen Tian — Beihang University
Sen Zhong — Beihang University
Yongliang Cheng — Beihang University
Hao Liu — Beihang University
Deyuan Liu — Beihang University

●Oral-02 14:15-14:30

[0595] A Modified Moving Target Defense Strategy for Enhancing Security in Networked Control Systems against Joint Attacks

Jiahao Huang — Zhejiang University of Science and Technology
Zhenyi Zhang — Zhejiang University of Science and Technology
Jiahao Dai — Zhejiang University of Science and Technology
Yongyuan Xu — The Chinese University of Hong Kong CUHK (Shenzhen)
Qingkai Meng — University of Cyprus

●Oral-03 14:30-14:45

[0552] Intention Recognition for Spacecraft Pursuit-Evasion Games Using Gaussian Processes

Lifan Zhou — Harbin Institute of Technology
Qizheng Zhang — Beijing Institute of Control and Electronics Technology
Yanning Guo — Harbin Institute of Technology
Pengyu Wang — Harbin Institute of Technology

●Oral-04 14:45-15:00

[0598] Brain-Inspired Decision Learning for Fault-Tolerant Flight Control under Active/Passive Wing Deformations

Yanhui Zhang — Zhejiang University
Qingkai Meng — University of Cyprus

Zhaolei Wang	Beijing Aerospace Automatic Control Institute
Weifang Chen	Zhejiang University

●Oral-05 15:00-15:15

[0501] Dynamic Coupling Analysis and Control of One-dimensional Tracking Turntable and Satellite Platform

Xinrui He	Harbin Institute of Technology
Ali Zolghadri	Bordeaux University
Chi Xu	Harbin Institute of Technology
Sen Yang	Harbin Institute of Technology
Zhenhua Wang	Harbin Institute of Technology

●Oral-06 15:15-15:30

[0046] New Configuration and Establishment Strategies for Elliptical Orbit Accompanying Flight Using the Tschauner-Hempel Equation

He Zhu	Shanghai Aerospace Control Technology Institute
Zhengyong Guo	Shanghai Academy of Spaceflight Technology
Jingmei Huang	Shanghai Aerospace Control Technology Institute
Mingyang Liu	Shanghai Aerospace Control Technology Institute

Parallel Session 25

Parallel Session 25 — Aug 5, Tuesday, 14:00-15:30
Oral Session 25 — Function Room 2

Tue-R.25 Diagnosis, Maintenance, and Digital Simulation of LEO Constellation Satellites

Chair: Jun Yang	China Academy of Space Technology
Chair: Senchun Chai	Beijing Institute of Technology
Chair: Xiaopeng Liu	China Academy of Space Technology
Chair: Qingrui Zhou	China Academy of Space Technology

●Oral-01 14:00-14:15

[0268] A Review of Research on Digital Satellites Based on Low Earth Orbit Constellations

Xiaopeng Liu	China Academy of Space Technology
Qianyu Li	Institute of Telecommnication and Navigation Satellites, China Academy of Space Technology
Jun Yang	Institute of Telecommnication and Navigation Satellites, China Academy of Space Technology
Yuhan Suo	Beijing Institute of Technology
Senchun Chai	Beijing Institute of Technology
Runqi Chai	Beijing Institute of Technology

●Oral-02 14:15-14:30

[0270] MSMD Matching Algorithm: Efficient Arbitrary Matching of Space Debris in Low Earth Orbit Constellations Using Distributed Grassmann Distance

Yuhan Suo	Beijing Institute of Technology
Xiaopeng Liu	China Academy of Space Technology
Runqi Chai	Beijing Institute of Technology
Dong Chen	Institute of Telecommnication and Navigation Satellites, China Academy of Space Technology
Senchun Chai	Beijing Institute of Technology

●Oral-03 14:30-14:45

[0523] Research on Architecture of Autonomous Mission Coordination and Operation for Mega-Constellations

Rong Ma	China Academy of Space Technology
Qingrui Zhou	China Academy of Space Technology
Wei Zheng	China Academy of Space Technology
Changhao Sun	China Academy of Space Technology
Luojia Hu	China Academy of Space Technology

●Oral-04 14:45-15:00

[0449] Distributed Mission Planning of Multiple Imaging Satellites via Game Theoretic Cooperation

Changhao Sun	China Academy of Space Technology
Xiangyin Zhang	Beijing University of Technology
Qingrui Zhou	China Academy of Space Technology

●Oral-05 15:00-15:15

[0514] A Distributed Cooperative Control Algorithm for Satellite Formation Based on Model Predictive Control

Hequan Huang	The 38th Research Institute of China Electronics Technology Group
Jinghan Huang	Northwestern Polytechnical University
Kuilong Yang	Northwestern Polytechnical University
Zengfu Wang	Northwestern Polytechnical University
Qingrui Zhou	China Academy of Space Technology

●Oral-06 15:15-15:30

[0451] Multi-UAV Air Combat Target Allocation Based on Improved Polar Lights Optimization

Huaiyi Wang	Beihang University
Huaxin Qiu	Beihang University
Zhengwei Shi	Beihang University
Xiaoman Zhang	Beihang University
Qing Zhang	Beihang University
Kun Wu	Beihang University

Parallel Session 26

Parallel Session 26 — Aug 5, Tuesday, 14:00-15:30
Oral Session 26 — Function Room 3

Tue-R.26 Large-Scale Constellation Control and Management

Chair: Shuyi Wang	Beijing Institute of Control Engineering
Chair: Tong Luo	Beijing Institute of Control Engineering
Chair: Yinan Ding	Beijing Institute of Control Engineering

●Oral-01 14:00-14:15

[0432] Improving Genetic Task Planning Method for Observing Moving Targets with Dual-satellite

Yu Chi	Beijing Institute of Technology

●Oral-02 14:15-14:30

[0048] Replying LEO Space Congestion: Analysis of Relative Motion Threat Domains and Exploration of Environmental Carrying Capacity

Ao Shen	Beijing Institute of Technology
Lincheng Li	Beihang University
Jingrui Zhang	Beijing Institute of Technology
Yiran Ma	Beijing Institute of Technology

●Oral-03 14:30-14:45

[0493] Auto Formation Control of the LEO Internet Constellation

Qirui Liu — Beijing Institute of Control Engineering
Tong Luo — Beijing Institute of Control Engineering
Jiawei Tao — Beijing Institute of Control Engineering
Yu Zhang — Beijing Institute of Control Engineering
Wenlan Tang — Beijing Institute of Control Engineering
Jie Yang — Beijing Institute of Control Engineering

●Oral-04 14:45-14:45

[0502] Distributed Task Planning Method Based on Potential Game for Agile Imaging Satellite Constellation

Yinan Ding — Beijing Institute of Control Engineering
Yongjun Lei — Beijing Institute of Control Engineering
Shuyi Wang — Beijing Institute of Control Engineering

●Oral-05 15:00-15:15

[0329] Rapid Assembly Mission Planning of Remote Sensing Constellations for Hotspot Area Observation

Junyu Chen — Harbin Institute of Technology
Jijun Liu — China Academy of Aerospace System and Innovation
Baolin Wu — Harbin Institute of Technology
Zhaobo Sun — Harbin Institute of Technology

●Oral-06 15:15-15:30

[0417] A Multi-Objective Enhanced Estimation of Distribution Algorithm for Proactive Scheduling of Agile Earth Observation Satellites

Xinyu Zhang — Beijing Institute of Technology
Hongyu Yin — Beijing Institute of Technology
Yixin Deng — Beijing Institute of Technology
Yisi Zhang — Beijing Institute of Technology
Tianyu Sun — Beijing Institute of Technology
Xiaoze Liu — Beijing Institute of Technology
Chuge Wu — Beijing Institute of Technology
Shisheng Cui — Beijing Institute of Technology

Parallel Session 27

Parallel Session 27 — Aug 5, Tuesday, 14:00-15:30
Oral Session 27 — Meeting Room

Tue-R.27 Flexible Structure Control for Aerospace

Chair: Wei Fan — Harbin Institute of Technology
Chair: Ping Zhou — Harbin Institute of Technology

●Oral-01 14:00-14:15

[0310] Topology Optimization Design and Application of Thermal Shock Suppression Structure

Jinsheng Guo — Harbin Institute of Technology
Yicheng Lu — Harbin Institute of Technology
Yujun Kou — Harbin Institute of Technology
Tianhe Zhang — Innovation Academy for Microsatellites Chinese Academy of Sciences

●Oral-02 14:15-14:30

[0288] Decentralized LQR Control of Gyroelastic Space Structures for On-Orbit Assembly

Jingyu Guo Harbin Institute of Technology
Chengfei Yue Harbin Institute of Technology
Ziran Liu Harbin Institute of Technology
Xibin Cao Harbin Institute of Technology

●Oral-03 14:30-14:45

[0376] Distributed Control of a Single Flexible Solar Wing Spacecraft

Haobo Kang Harbin Institute of Technology
Huayi Li Harbin Institute of Technology
Qian Cao Harbin Institute of Technology

●Oral-04 14:45-15:00

[0188] Oscillatory Failure Case Detection of a Flexible Aircraft by Wavelet Decomposition

Congjie Yang School of Aeronautics and Astronautics Shanghai Jiao Tong University
Shiqian Liu Shanghai Jiao Tong University
Qian Zhang Shanghai Jiao Tong University
Jiaxin Chen Shanghai Jiao Tong University

●Oral-05 15:00-15:15

[0064] Fixed-Time Composite Neuro-Adaptive Prescribed Performance Control of Spacecraft Considering Model Uncertainties and External Disturbances

Mostafa Ezabadi Sharif University of Technology
Seyyed Ali Emami Sharif University of Technology
Paolo Castaldi University of Bologna

●Oral-06 15:15-15:30

[0054] Attitude Control of Flexible Spacecraft Modeled Using Reference Nodal Coordinate Formulation

Lei Zhang Harbin Institute of Technology
Wei Fan Harbin Institute of Technology
Ping Zhou Harbin Institute of Technology
Hui Ren Harbin Institute of Technology

Poster Presentations

Poster Session	Aug 4, Monday, 08:30-12:00 Function Room 1

●Poster-01

[0406] Exploring the Teaching Mechanism for Developing Engineering Innovation Abilities through Project-Based Learning in Spacecraft Control

Lujun Fu	Taizhou University
Youmin Gong	Harbin Institute of Technology (Shenzhen)
Haiting Dong	Taizhou University
Guangfu Ma	Harbin Institute of Technology

●Poster-02

[0074] Research on Air-Ground Collaborative Operation Based on 4D Trajectory

Jie Liu	China Aeronautical Radio Electronics Research Institute
Jizhi Mao	China Aeronautical Radio Electronics Research Institute
Lidong Zhang	China Aeronautical Radio Electronics Research Institute

●Poster-03

[0322] A Data-Driven Risk Level Prediction Method for Non-Cooperative Spacecraft Based on 1-D CNN

Fanyi Zeng	Harbin Institute of Technology
Weike Wang	Harbin Institute of Technology
Mengping Zhu	Qian Xuesen Laboratory of Space Technology China Academy of Space Technology
Dake Chen	Qian Xuesen Laboratory of Space Technology China Academy of Space Technology
Shunli Li	Harbin Institute of Technology

●Poster-04

[0047] Map Matching Technology Based on 3D Terrain Point Cloud for Airborne Multi-Beam Lidar

Yilin Liu	Nanjing University of Aeronautics and Astronautics
Zhi Xiong	Nanjing University of Aeronautics and Astronautics
Tianji Wu	Nanjing University of Aeronautics and Astronautics
Bing Hua	Nanjing University of Aeronautics and Astronautics

●Poster-05

[0192] One-way Time Synchronization for Space Users Based on Navigation Inter-satellite Links

Yuankun Fang	Xichang Satellite Launch Center
Jingxi Lei	Xichang Satellite Launch Center
Leyuan Sun	Xichang Satellite Launch Center

●Poster-06

[0504] Feature-matched Robust Control Enabled by Data-driven Dynamics Online Learning

Zekai Zhang	Beihang University
Tengjie Zheng	Beihang University
Lin Cheng	Beihang University

●Poster-07

[0289] Ascent Guidance for Combined Cycle Hybrid Vehicles Based on Model Predictive Convex Programming

Zhiwen Liao	Harbin Engineering University
Jiayuan Ding	China Academy of Launch Vehicle Technology
Xun Fu	Harbin Engineering University
Jing Zhang	China Academy of Launch Vehicle Technology
Jiangtao Xu	Harbin Institute of Technology
Shihao Ma	Harbin Engineering University

●Poster-08

[0297] An Improved Preset-Trajectory-Based Preassigned Performance Control Method for Skid-To-Turn Aircraft

Junyan Yang	Harbin Institute of Technology
Yan Zhen	Harbin Institute of Technology
Mingzhe Hou	Harbin Institute of Technology

●Poster-09

[0072] Adaptive Control for Reusable Aerocraft Based on Model Predictive Control

Yanqi Feng	Sun Yat-sen University
Ben Yang	China Academy of Launch Vehicle Technology
Zhigang Wu	Sun Yat-sen University
Haizhao Liang	Sun Yat-sen University

●Poster-10

[0212] Reinforcement Learning Adaptive Control for Transition Mode of Coaxial Dual-Rotor High-Speed Helicopter

Mengmeng Lv	Nanjing University of Aeronautics and Astronautics
Jianan Chen	Nanjing University of Aeronautics and Astronautics
Yaqin Li	Nanjing University of Aeronautics and Astronautics
Fengying Zheng	Nanjing University of Aeronautics and Astronautics

●Poster-11

[0111] Prescribed Performance Attitude Tracking Control for Spacecraft Using AdaptiyeLearning

Yiqi Xu	China Academy of Electronic and Information Technology

●Poster-12

[0129] Reduced-Order Linear Active Disturbance Rejection Control for Electromechanical Servo Systems

Biao Li	Xi'an Aerospace Precision Electromechanical Institute
Ming Huang	Xi'an Aerospace Precision Electromechanical Institute
Xianli Li	Xi'an Aerospace Precision Electromechanical Institute
Tingting Bai	Xi'an Aerospace Precision Electromechanical Institute

●Poster-13

[0416] Composite Control of Electromechanical Servo Systems Based on Tracking Differentiator

Biao Li	Xi'an Aerospace Precision Electromechanical Institute
Kuan Cao	Xi'an Aerospace Precision Electromechanical Institute
Shan Li	Xi'an Aerospace Precision Electromechanical Institute
Peng Li	Xi'an Aerospace Precision Electromechanical Institute
Yiwei Wu	Xi'an Aerospace Precision Electromechanical Institute

●Poster-14

[0439] Parameter Optimization of Switched Tank Converter for DC bus conversion in Satellite Applications

Jie Yang	Northeastern University
Yifan Wang	Northeastern University
Wei Zheng	Beijing Institute of Control Engineering
Dakang Yuan	Beijing Institute of Control Engineering
Dongdong Ye	Beijing Institute of Control Engineering
Ge Wang	Beijing Institute of Control Engineering

●Poster-15

0448 Research on High-Performance Parallel Computers for Satellites Based on Chinese Domestic Multi-Core Processors

Zhongwei Liu	Harbin Institute of Technology
Huayi Li	Harbin Institute of Technology
Zhongzheng Zhang	Shandong Institute of Space Electronic Technology
Bingui Xu	Shandong Institute of Space Electronic Technology

●Poster-16

0181 A Neighbor-Based Distributed Routing Strategy for Heterogeneous Satellite Constellation Networks

Yongqi Zhang	Sun Yat-sen University
Yecheng Li	Sun Yat-sen University
Jihe Wang	Sun Yat-sen University

●Poster-17

0445 Consensus-Based Formation Control for Multi-Agent Systems with Communication Delay and Dynamic Network Topologies

Binfu Ren	Sichuan University
Pengfei Tang	Sichuan University
Rongrui Liu	Sichuan University
Xu Zhang	China Academy of Space Technology
Yuandong Ji	Sichuan University

●Poster-18

0498 Design of a Real-Time Control System for PMSM Based on x86+FPGA Architecture

Xuan Wang	North China University of Technology
Zhe Dong	North China University of Technology
Nachuan Liu	North China University of Technology
Chen Gao	North China University of Technology
Jiahuan He	North China University of Technology
Zhao Gao	North China University of Technology

●Poster-19

0314 Intelligent Parameter Tuning Sliding Mode Control for Hypersonic Vehicle Based on the Soft Actor-Critic

Wenxi Xu	Harbin Institute of Technology
Liguo Tan	Harbin Institute of Technology
Yan Zhen	Harbin Institute of Technology
Mingzhe Hou	Harbin Institute of Technology

●Poster-20

0050 Enhanced PID+ Controller for Satellite Attitude Control in Large-Angle Rapid Maneuvers

Zichao Li	Xidian University
Jian Zhang	Shanghai Academy of Spaceflight Technology
Yu Cheng	Zhizi Automobile Technology Co., Ltd.

Chen Gao	North China University of Technology

●Poster-21

0450 Fixed-Time Sliding-Mode Formation Control for Air-Sea Heterogeneous Unmanned Systems

Tingxuan Liu	Sichuan University
Binfu Ren	Sichuan University
Rongrui Liu	Sichuan University
Xu Zhang	China Academy of Space Technology
Guohao Sun	Multi-source Information Intelligent Fusion Key Laboratory of Sichuan Province

●Poster-22

0456 Consensus-Based Formation Tracking for Heterogeneous Cross-Domain Unmanned Cluster

Pengfei Tang	Sichuan University
Jiaheng Wu	Sichuan University
Handing Guo	Sichuan University
Xu Zhang	China Academy of Space Technology
Suchuan Zhong	Sichuan University

●Poster-23

0436 A Distributed Proximal-derivative Algorithm for Nonsmooth Convex Optimization

Zhiqi Liang	Anhui University
Jinshan Bian	Anhui University
Wei Su	Tianjin University
Chaoxu Mu	Tianjin University

●Poster-24

0090 Dynamic Event-Triggered Secure Formation Tracking for Multi-Agent Systems with Application to Spacecraft Formation

Jing Mao	Heilongjiang University
Jianting Lyu	Heilongjiang University
Dai Gao	Harbin Institute of Technology
Yadong Lu	Beijing Institute of Spacecraft System Engineering

●Poster-25

0407 GEO Spacecraft Observation Scheduling via Multiple Space-based Sensor Based on UB-ICNPA

Xi Long	National University of Defense Technology
Jinrun Chen	National University of Defense Technology
Leping Yang	National University of Defense Technology
Yanwei Zhu	National University of Defense Technology
Weiwei Cai	National University of Defense Technology
Huan Huang	National University of Defense Technology

●Poster-26

0330 A Clustering Method for Group Targets in Early Warning Systems Based on Threat-level Features

Chao Xue	Beijing Institute of Control Engineering
Jiangtao Zhao	Beijing Institute of Control Engineering
Zhuhua Si	Beijing Institute of Control Engineering
Bin Ren	Beijing Institute of Control Engineering

●Poster-27

[0340] Reinforcement Learning-Based Scheduling Strategy for Low-Orbit Satellite Beam-Hopping Resources in Hot-Spot Regions

Junge Wang	The Institute of Defense Science and Technology Innovation
Wanting Qin	The Institute of Defense Science and Technology Innovation
Dechao Ran	The Institute of Defense Science and Technology Innovation
Liangliang Li	Beijing Institute of Technology
Junhui Xu	Beijing Institute of Technology
Zhouhui Tuo	Institute of Systems Engineering
Ruichen Zhang	The Institute of Defense Science and Technology Innovation

●Poster-28

[0404] Satellite Cluster Game Task Allocation Method Based on Reinforcement Learning

Haolong Feng	Shanghai Aerospace Control Technology Institute
Shengyang Liu	Shanghai Aerospace Control Technology Institute
Ting Song	Shanghai Aerospace Control Technology Institute
Fei Han	Shanghai Aerospace Control Technology Institute

●Poster-29

[0527] DDPG Based Safe and Efficient Trajectory Planning for Asteroid Visual Coverage

Shengyang Liu	Shanghai Aerospace Control Technology Institute
Haolong Feng	Shanghai Aerospace Control Technology Institute
Ting Song	Shanghai Aerospace Control Technology Institute
Fei Han	Shanghai Aerospace Control Technology Institute

●Poster-30

[0515] Leveraging Large Language Models for Dynamic Multi-Objective Optimization in UAV Sensor-Target Assignment

Yisong Zhang	Harbin Institute of Technology
Guoxing Yi	Harbin Institute of Technology
Huapin Geng	Beijing Electro-mechanical Engineering Institute
Hao Wang	Harbin Institute of Technology

●Poster-31

[0520] Autonomous Decision-making Technology for UAVs Based on Large Language Models

Yuchao Zhou	Zhejiang University
Huapeng Lin	Zhejiang University
Miao Yu	Zhejiang University

●Poster-32

[0149] Health State Assessment of Metro Train Traction Converter under Variable Operating Conditions Based on Feature Extraction

Rujun Jia	Beihang University

●Poster-33

[0152] The Intelligent Balancing Design of Air-Bearing Table's Mass Properties Based on Deep Reinforcement Learning

Zongyuan Liu	Harbin Institute of Technology
Xingju Tang	Shanghai Aerospace Control Technology Institute
Cheng Xu	Harbin Institute of Technology
Guangcheng Ma	Harbin Institute of Technology
Hongwei Xia	Harbin Institute of Technology

●Poster-34

[0405] Variable Structure Interacting Multiple-Model Filtering Based on Deep Q-Network

Yu Lu	National University of Defense Technology
Haiyin Zhou	State Key Laboratory of Astronautics Dynamics
Siyuan Tian	National University of Defense Technology
Huiyu Chen	National University of Defense Technology
Jiongqi Wang	National University of Defense Technology

●Poster-35

[0481] Hypersonic Vehicle Trajectory Tracking Based on Moving Horizon Estimation

Xudong Ji	Harbin Institute of Technology
Zhe Chen	China Satellite Network Application Co., Ltd.
Zichu Liu	Harbin Institute of Technology
Changsheng Gao	Harbin Institute of Technology
Wuxing Jing	Harbin Institute of Technology

●Poster-36

[0531] Ballistic Target Tracking Algorithm Based on Dynamic Satellite Selection Strategy

Xiaolin Xu	National University of Defence Technology
Yingxiao Yi	National University of Defence Technology
Jingjing Zhang	National University of Defence Technology
Dejiao Luo	National University of Defence Technology
Yichen Xie	National University of Defence Technology
Xueying An	National University of Defence Technology

●Poster-37

[0163] Atmospheric Density Error Propagation Model and Sensitivity Analysis Based on Falling-Sphere Technology

Haozhuo Liu	Harbin Engineering University
Pengyu Zhang	China Aerospace Science and Technology Corporation
Yanxue Zhang	China Aerospace Science and Technology Corporation
Xinhua Zhao	Harbin Engineering University

●Poster-38

[0112] Data-Driven Online Modeling and Tracking of Hypersonic Glide Vehicles

Zichu Liu	Harbin Institute of Technology
Yudong Hu	Harbin Institute of Technology
Changsheng Gao	Harbin Institute of Technology
Wuxing Jing	Harbin Institute of Technology

●Poster-39

[0505] Adaptive Target Tracking Method for Hypersonic Gliding Vehicle's Glide Phase

Hengguo Zhang	National University of Defense Technology
Kebo Li	National University of Defense Technology
Yangang Liang	National University of Defense Technology
Shuang Liu	National University of Defense Technology

●Poster-40

[0349] LSTM-Based Identification Method for Integrated Inertia of Astronaut-EMU System

Mengxuan Peng	Harbin Institute of Technology
Yunhai Geng	Harbin Institute of Technology

●Poster-41

[0390] Improved LSD Line Detection Algorithm Based on Geometric Feature Constraints

Chuang Song — National Key Laboratory of Complex System Control and Intelligence
Jinrong Fan — National Key Laboratory of Complex System Control and Intelligence

●Poster-42

[0397] Fast Symbolic Computation of Koopman Operator Approximation via Galerkin Method

Bin Nan — Harbin Institute of Technology
Hanjun Wang — Harbin Institute of Technology
Tianji Ma — Harbin Institute of Technology
Shunli Li — Harbin Institute of Technology

●Poster-43

[0171] Design and Effectiveness Evaluation of a Flexible Spacecraft Control Test System

Chenhe Yang — Harbin Institute of Technology
Ruiheng Hu — Shanghai Aerospace Control Technology Institute
Li Li — Harbin Institute of Technology (Weihai)
Hongwei Xia — Harbin Institute of Technology
Guangcheng Ma — Harbin Institute of Technology

●Poster-44

[0346] Collision Analysis of Tethered-net for First Person View Racing Drones Interception

Ju He — Nanjing University of Science and Technology
Zhaojun Pang — Nanjing University of Science and Technology
Zhonghua Du — Nanjing University of Science and Technology

●Poster-45

[0532] An Improved Quantum-Behaved Particle Swarm Optimization Method for Ring Truss Deployable Antenna

Shan Jin — Harbin Institute of Technology
Chuanjiang Li — Harbin Institute of Technology

●Poster-46

[0326] Research on Teleoperation Control of Flexible Manipulator Based on Hybrid Impedance

Rui Fan — Jinan University
Wei Lv — Jinan University
Song Guo — Wuhan Second Ship Design Research Institute
Feiyan Min — Jinan University

●Poster-47

[0266] Robust Control of the Flexible Robotic Arm Based on RBF Neural Networks for Fault Repair in Low Earth Orbit Satellite Constellations

Xiaopeng Liu — China Academy of Space Technology
Wanpeng Zhao — Beijing Institute of Technology
Jun Yang — China Academy of Space Technology
Senchun Chai — Beijing Institute of Technology
Runqi Chai — Beijing Institute of Technology

●Poster-48

[0480] Design and Test for a Plate-type Frictionless Eddy Current Damper

Cheng Luo — Beihang University

Min Luo Beijing Institute of Space System Engineering

●Poster-49

0070 Construction of Artificial Potential for Obstacle Avoidance in Drone Formation Flight

Songsong Ji Aerospace Times Feihong Technology Co. Ltd
Qite Wang Aerospace Times Feihong Technology Co. Ltd
Song Han Aerospace Times Feihong Technology Co. Ltd
Jia Zhao Aerospace Times Feihong Technology Co. Ltd

●Poster-50

0037 Formation Control for Fixed-Wing UAV Swarms Considering Online Whole Collision Avoidance

Zhitao Liu China Academy of Engineering Physics
Xu Zhang China Academy of Engineering Physics
Huan Zhou China Academy of Engineering Physics
Junsheng Zheng China Academy of Engineering Physics
Xinghao Feng China Academy of Engineering Physics

●Poster-51

0060 A Novel Time-Synchronized Distributed Consensus Control Design for Multi-UAV Formation

Shaocong Wang Xidian University
Nan Liu AVIC Aerodynaiviics Research Institute
Weisheng Chen Xidian University
Hao Dai Xidian University
Jing Chang Xidian University

●Poster-52

0258 Construction and Guidance Algorithm of the Natural Formation Flyings on Elliptical Orbits

Tong Luo Beijing Institute of Control Engineering

●Poster-53

0402 A Fully Actuated System Approach for Flexible Spacecraft Fault-Tolerant Attitude Control

Zunhao Yao Harbin Institute of Technology
Ruotong Shi Harbin Institute of Technology
Ming Liu City University of Hong Kong

●Poster-54

0139 Adaptive Finite-Time Fuzzy Control for Nonlinear Systems with External Disturbances

Aiqing Wu Ordos Vocational College of Eco-environment
Lei Qin Ordos Vocational College of Eco-environment

●Poster-55

0396 Bias-Policy Iteration Based Optimal Output Regulation for Partially Unknown Linear Periodic Systems

Huaiyuan Jiang Harbin Institute of Technology
Xiang Li Harbin Institute of Technology
Bin Zhou Harbin Institute of Technology

●Poster-56

0238 Real-Time Trajectory Generation for Hypersonic Vehicles Based on Improved PSO-BP Neural Network

Encheng Dai Rocket Force University of Engineering
Hui Xu Rocket Force University of Engineering

Hao Wei — Rocket Force University of Engineering
Guangbin Cai — Rocket Force University of Engineering

●Poster-57

0160 Similarity Grouping Method for Multi-Channel Coupled Telemetry Data of On-Orbit Spacecraft
Ruixue Li — Harbin Institute of Technology
Zexu Zhang — Harbin Institute of Technology

●Poster-58

0336 TFDL-GAN for Fault Diagnosis of Aero-Engine Accessory Gearbox with Imbalanced Data
Sun Yao — Shenyang Aircraft Corporation
Bowen Xiao — Dalian University of Technology
Zhao Guang — Dalian University of Technology
Ma Song — Dalian University of Technology
Yunbo Yuan — Dalian University of Technology

●Poster-59

0485 Deep Multi-level Anomaly Detection Approach for Spacecraft Telemetry Data
Lin Yang — Harbin Institute of Technology
Xiyuan Peng — Harbin Institute of Technology
Yuchen Song — Harbin Institute of Technology
Datong Liu — Harbin Institute of Technology

●Poster-60

0565 A Multi-Task Fault Diagnosis Method for Aircraft Rudder Loop System Based on Wavelet Packet Transform and Multi-Gate Mixture of Experts
Xingyu Lin — Nanjing University of Aeronautics and Astronautics
Yuehua Cheng — Nanjing University of Aeronautics and Astronautics
Bin Jiang — Nanjing University of Aeronautics and Astronautics

●Poster-61

0567 Fault Detection Technology of Aircraft Rudder Control Loop System Based on Intelligent Algorithm
Kangyu Hou — Nanjing University of Aeronautics and Astronautics
Jiajian Zhu — Nanjing University of Aeronautics and Astronautics
Yuehua Cheng — Nanjing University of Aeronautics and Astronautics
Bin Jiang — Nanjing University of Aeronautics and Astronautics

●Poster-62

0597 Precision Component Alignment Detection and Contact-Wear Particulates Visual Inspection for Spacecraft Components
Yongbin Zhang — Beihang University
Gang Zhou — Beijing Institute of Control Engineering
Mengyin Wang — Beijing Institute of Control Engineering
Qiang Zhang — Beijing Institute of Control Engineering
Yuliang Wang — Beihang University

●Poster-63

0257 Research and Application of Multimodal Fault-Tolerant Computers
Qinglin Qiu — Shandong Institute of Aerospace Electronics Technology
Yi Zhang — Shandong Institute of Aerospace Electronics Technology

Shenbo Zhu	Shandong Institute of Aerospace Electronics Technology
Jiang Yang	Shandong Institute of Aerospace Electronics Technology
Anqing Zhang	Shandong Institute of Aerospace Electronics Technology
Xiumin Fu	Shandong Institute of Aerospace Electronics Technology

●Poster-64

0413 SD-Sync: Software-Defined Time Synchronization Management and Control for Aerospace TSN

Wenchao Li	National University of Defense Technology
Yinhan Sun	National University of Defense Technology
Liangfeng Tan	National University of Defense Technology
Zhigang Sun	National University of Defense Technology

●Poster-65

0412 Research on Communication Fault Diagnosis for Large-scale Low Earth Orbit Constellations

Ran Wang	Harbin Institute of Technology
Yulong Yang	Shanghai Aerospace Control Technology Institute
Rongqing Yu	Harbin Institute of Technology
Yan Xiao	Harbin Institute of Technology
Dong Ye	Harbin Institute of Technology

●Poster-66

0537 Adaptive Parameters Reconstruction Model for Satellite Fault Detection

Weiyang Li	Tsinghua University
Fan Yang	Tsinghua University

●Poster-67

0194 MDM: A Mamba-Conditioned Diffusion Model for Spacecraft Lithium-Ion Battery RUL Prediction

Bing Yu	Harbin Institute of Technology
Wenbo Ding	Harbin Institute of Technology
Zhiming Yang	Harbin Institute of Technology
Gang Xiang	Beijing Aerospace Automatic Control Institute
Yang Yu	Harbin Institute of Technology

●Poster-68

0267 An Optimization Method of Low Orbit Constellation Satellite Fault Diagnosis Based on Improved Artificial Bee Colony Algorithm

Qinghua Zhu	Beijing Institute of Technology
Xiaopeng Liu	China Academy of Space Technology
Shengwei Pei	Institute of Telecommunication and Navigation Satellites China Academy of Space Technology
Senchun Chai	Beijing Institute of Technology
Runqi Chai	Beijing Institute of Technology

●Poster-69

0592 Shallow Bayesian Neural Networks and Cross-Domain Transfer Learning for Predictive Manufacturing Via Few-Shot Data

Luchen Wu	Fuzhou University
Tianyue Yang	University of Macau
Cangning Fan	Harbin Institute of Technology
Minhan Liu	Harbin Institute of Technology

Hao Sun — Harbin Institute of Technology

●Poster-70

0042 High-Precision Calibration Algorithm for Pointing Accuracy of a Two-Axis Rotary Table and Precision Tracking Camera

Luonan Chang — Beijing Institute of Control Engineering
Qiang Yu — Beijing Institute of Control Engineering
Chao Li — Beijing Institute of Control Engineering

●Poster-71

0313 Analytical Solutions of Random Vibration Responses of Laminates for Satellite Structures under Multi-point Excitation

Qingyang Deng — Harbin Institute of Technology

●Poster-72

0041 Lattice Piecewise Affine Approximation of Explicit Model Predictive Control and Its Application in Satellite Attitude Control

Zhengqi Xu — Harbin Institute of Technology
Jun Xu — Beijing Institute of Control Engineering
Aiguo Wu — Beijing Institute of Control Engineering
Shuning Wang — Tsinghua University

●Poster-73

0234 Sliding Mode Adaptive Control for Reconfigurable ASPC Spacecraft

Mingren Han — Beijing Institute of Control Engineering
Liang Tang — Beijing Institute of Control Engineering
Xin Guan — Beijing Institute of Control Engineering

●Poster-74

0400 High-Precision Integrated Position and Attitude Control of Satellites Using Stewart Platform

Yibin He — Harbin Institute of Technology
Jianqiao Zhang — Shanghai Institute of Satellite Engineering
Yan Xiao — Harbin Institute of Technology
Dong Ye — Harbin Institute of Technology
Zhaowei Sun — Harbin Institute of Technology

●Poster-75

0127 Research on Steady-State Cruise Thrust Vector Optimization Control for Hypersonic Vehicles Based on Particle Swarm Optimization Algorithm

Zijun Zhang — National University of Defense Technology
Yunfan Zhou — National University of Defense Technology
Leichao Yang — National University of Defense Technology
Wenzhong Jin — National University of Defense Technology
Yuqi Wang — National University of Defense Technology
Junyan Li — National University of Defense Technology

●Poster-76

0207 Degree of Controllability Analysis and Calculation of Large Moving-mass Vehicles

Hanyu Ni — Harbin Institute of Technology
Qingfeng Du — Harbin Institute of Technology

Changsheng Gao Harbin Institute of Technology
Wuxing Jing Harbin Institute of Technology
Peng Sui Harbin Institute of Technology

●Poster-77

[0246] A Multi-constraint Guidance Law for Cruise Missile Independent of Time-to-go Prediction

Ningyu Wang Harbin Institute of Technology
Borui Tang Harbin Institute of Technology
Zhengtao Wang Harbin Institute of Technology
Xiao Liu System Design Institute of Hubei Aerospace Technology Academy

●Poster-78

[0198] Impact Angle Control Guidance Law Considering Field-Of-View Constraint Based on Deep Reinforcement Learning

Zhengtao Wang Harbin Institute of Technology
Ningyu Wang Harbin Institute of Technology
Borui Tang Harbin Institute of Technology

●Poster-79

[0282] Deep Reinforcement Learning Based Exoatmospheric Interception Guidance Algorithm

Jin Tang National University of Defense Technology College of Aerospace
Kebo Li National University of Defense Technology
Yangang Liang National University of Defense Technology
Yue Su National University of Defense Technology College of Aerospace

●Poster-80

[0248] Impact Time and Angle Control Guidance With Terminal Speed Constraint Based on Periodic Delayed Feedback

Haoyu Zheng Harbin Institute of Technology
Qiudi Wang Harbin Institute of Technology
Zhiqiang Gong Harbin Institute of Technology
Haifeng Tang Harbin Institute of Technology
Huaiyuan Jiang Harbin Institute of Technology
Bin Zhou Harbin Institute of Technology

●Poster-81

[0208] Analysis of Evader Escape Strategy with Three-dimensional Nonlinear Model

Zhijie Zhang Harbin Institute of Technology
Qingfeng Du Harbin Institute of Technology
Changsheng Gao Harbin Institute of Technology
Wuxing Jing Harbin Institute of Technology
Peng Sui Harbin Institute of Technology

●Poster-82

[0260] Cislunar Space Constellation Design for Future Lunar Resource Development and Utilization

Xiao Zhang Harbin Institute of Technology
Zhaowei Sun Harbin Institute of Technology
Dong Ye Harbin Institute of Technology

●Poster-83

[0131] A Deep Learning-Based Method for Target Assignment

Bingsan Yang	Sun Yat-Sen University
Jingshuai Cao	Sun Yat-Sen University
Jiaxin Hu	Sun Yat-Sen University
Tao Wang	Sun Yat-Sen University

●Poster-84

[0242] Cooperative Target Assignment with One-To-Many Mode Based on the Non-Dominated Sorting Kepler Optimization Algorithm

Luo Wang	Nanjing University of Aeronautics and Astronautics
Qingxian Jia	Nanjing University of Aeronautics and Astronautics
Huayi Li	Harbin Institute of Technology
Xiuqin Sun	Maanshan College

●Poster-85

[0201] A Machine Learning-Based Compensation Method for Inductosyn Angle Measurement Errors

Xinyi Wang	Harbin Institute of Technology
Youtao Shen	Shanghai Aerospace Control Technology Institute
Changbo Ma	Harbin Institute of Technology
Guangcheng Ma	Harbin Institute of Technology
Hongwei Xia	Harbin Institute of Technology

Poster Session — Aug 4. Monday, 14:00-18-00, Function Room 1

●Poster-86

[0437] An Improved K4PCS Registration Algorithm for Spacecraft Symmetric Structures: Segmentation and Constraint Optimization

Wenhong Pang	Nanjing University of Science and Technology
Yifei Wu	Nanjing University of Science and Technology
Qingwei Chen	Nanjing University of Science and Technology

●Poster-87

[0308] DOA and Doppler Shift Fusion-based Positioning with LEO Satellite Signals of Opportunity

Yichao Zhang	Beijing University of Posts and Telecommunications
Xiangtian Zhao	Beijing University of Posts and Telecommunications
Yafei Zhao	Beijing University of Posts and Telecommunications
Mugen Peng	Beijing University of Posts and Telecommunications

●Poster-88

[0162] High-precision Frequency Split Identification and Balancing of the Hemispherical Resonator Gyro via Virtual Precession

Ning Wang	Harbin Institute of Technology
Zhennan Wei	Harbin Institute of Technology
Guoxing Yi	Harbin Institute of Technology
Yibo Feng	Beijing Institute of Aerospace Control Devices
Cong Wang	Beijing Institute of Aerospace Control Devices

●Poster-89

[0347] Modeling and Analysis of Space Tethered System with Space Net

Haojie Qi	Nanjing University of Science and Technology

Zhaojun Pang Nanjing University of Science and Technology
Jia Guo Nanjing University of Science and Technology
Zhonghua Du Nanjing University of Science and Technology

●Poster-90

[0464] Torque Analysis of Rotating Target De-Tumbling Based on Finite Element Method

Lei Du Beijing Institute of Technology
Donglin Xue Beijing Aerospace Automatic Control Institute
Feng Li Naval Equipment Department
Zhen Chen Beijing Institute of Technology
Hengzai Hu Beijing Institute of Technology
Ning Dong Beijing Institute of Technology
Jiabin Chen Beijing Institute of Technology

●Poster-91

[0369] Design and Actuation of a Rigid-Soft Coupled Pneumatic Peristaltic Robot for Pipeline Environments

Qinghe Han Beijing University of Chemical Technology
Shuai Kang Beijing University of Chemical Technology
Jingran Xu Beijing University of Chemical Technology
Shuqian He Beijing University of Chemical Technology
Longchuan Li Beijing University of Chemical Technology

●Poster-92

[0239] MOGPE-RRT*: Path Planning Algorithm of Space Manipulator Based on Uncertainty Quantification Regression Learning Improved RRT*

Shanghan Liu Sichuan University
Hui Zhong Sichuan University
Yun Wang Sichuan University
Aojun Zhang Sichuan University
Peiyao Qin Sichuan University
Kai Zhang Sichuan University

●Poster-93

[0291] A Hierarchical Multiscale Feature Fusion Network Based on Mask2Former for Spacecraft Component Recognition

Zimo Zhuo Nanjing University of Science and Technology
Yifei Wu Nanjing University of Science and Technology
Qingwei Chen Nanjing University of Science and Technology

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Zhang Chen	Tsinghua University
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Wei Zhang	Shenyang Institute of Automation Chinese Academy of Sciences
Zhaoguang Wang	Shenyang Institute of Automation Chinese Academy of Sciences
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Mugen Peng	Beijing University of Posts and Telecommunications

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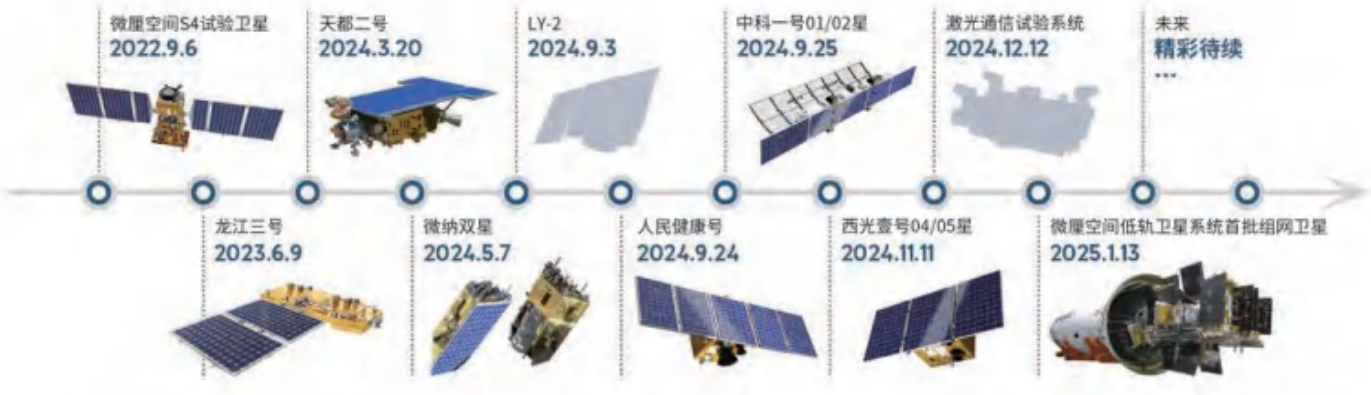

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- 可穿戴外骨骼机器人
- 四足机器人
- 灵巧手
- 水下机器人
- 医疗机器人
- 精准测量
- 移动机器人

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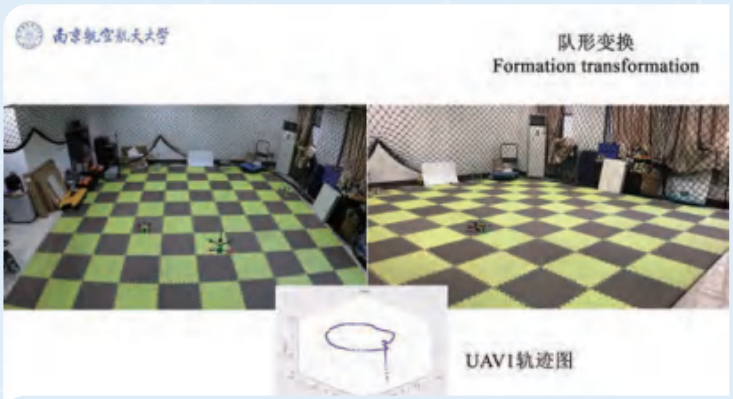

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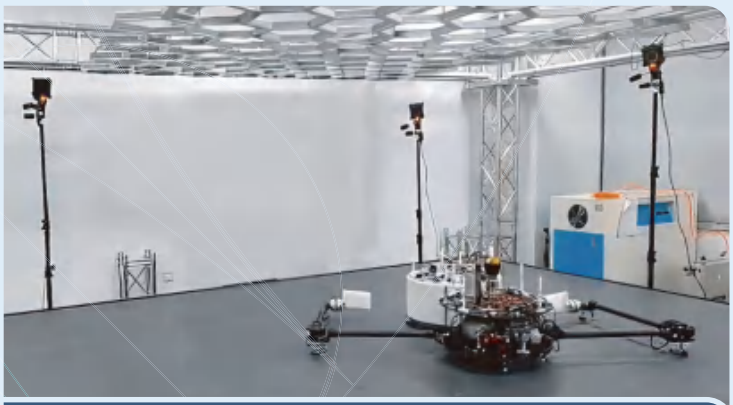

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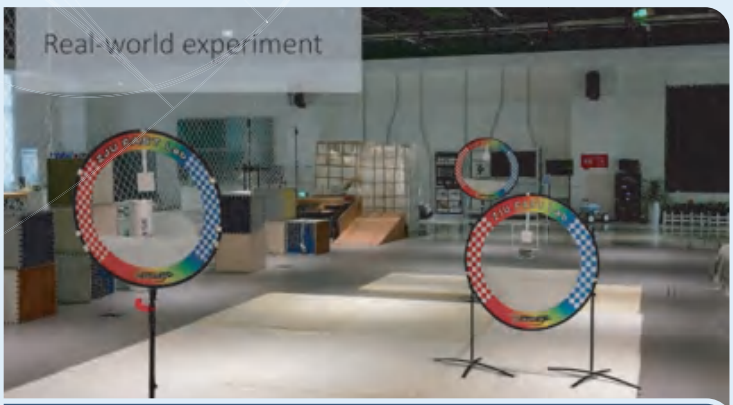

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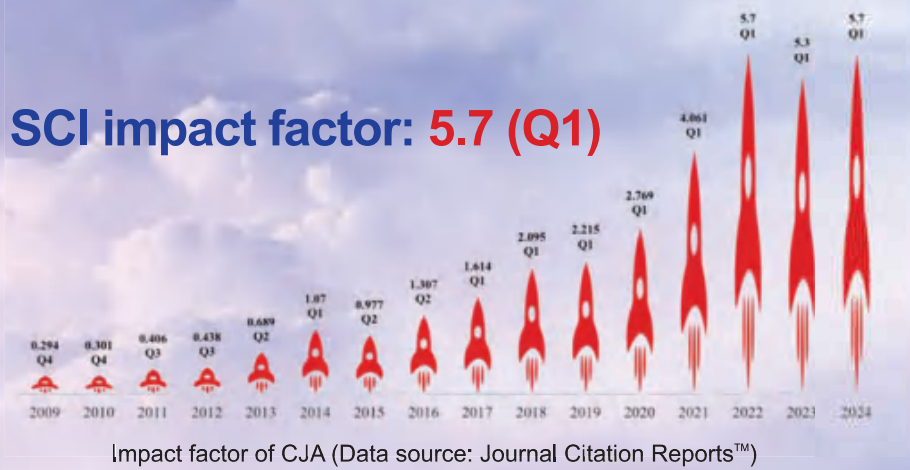

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