2025 第八届 IEEE 国际无人系统大会
特邀专题简介表

特邀专题名称

空天遥感大数据的智能处理与可信识别

组织者

1. 蒋雯，教授，西北工业大学

2. 耿杰，副教授，西北工业大学

3. 邓鑫洋，副教授，西北工业大学

4. 朱金彪，正高级工程师，中国科学院空天信息创新研究院

个人简介

蒋雯，西北工业大学教授，博士生导师，国家级领军人才，空天电子信息感知与光电控制教育部重点实验室副主任，中国指挥与控制学会理事、信息融合专委会副主任委员、多域态势感知与认知专委会常务委员、指挥与控制网络专委会常务委员，出版学术专著 3 部，授权发明专利 40 余项，第一或通讯作者发表 SCI 论文 80 余篇，第一完成人获中国指挥与控制学会科技进步一等奖、国防科技进步二等奖和陕西省科学技术二等奖各一项，入选 2020、2021 年科睿唯安“全球高被引科学家”。

耿杰，西北工业大学副教授，博士生导师，CICC 青工委委员。长期致力于 SAR 微波遥感、人工智能、多源信息融合等领域科研工作。在 IEEE Transactions on Geoscience and Remote Sensing、ISPRS Journal of Photogrammetry and Remote Sensing、IEEE Transactions on Circuits and Systems for Video Technology、自动化学报等国内外高水平期刊发表 40 余篇论文，授权发明专利 10 余项。主持国家自然科学基金、国家重点研发计划子课题、陕西省重点研发计划项目等国家和省部级项目 10 余项。

邓鑫洋，西北工业大学副教授，博士生导师，CICC 青工委委员、信息融合专委会委员。从事智能算法安全、多源信息融合等领域研究，近年来先后主持或参与国家自然科学基金、国家科技重大专项等国家和省部级项目十余项，以第一作者或通讯作者身份发表学术论文 50 余篇，出版学术专著 3 部，申请国家发明专利 30 余项，获中国指挥与控制学会科技进步一等奖、国防科学技术进步二等奖、陕西省科学技术二等奖等奖励，入选科睿唯安全球高被引科学家。

朱金彪，中国科学院空天信息创新研究院正高级工程师，硕士生导师，中国科学院航空遥感中心副主任，中国科学院技术支撑人才、先进航电 3A 基础架构标准工作组委员、国际数字地球学会中国国家委员会数字极地专委会常务委员、中国指挥与控制学会融合智能与集成科学专业委员会常务委员。长期致力于航空遥感技术与应用研究、透视观测雷达技术研究等，近 10 年先后主持承担或作为主要成员参与国家重大科技基础设施、高分专项、国家重点研发计划、国防预研、中国科学院制高点、中国科学院先导专项、部委和地方科研项目 50 余项，发表论文 20 余篇，授权发明专利 40 余项，获北京市科技进步一等奖、中国电子学会科技进步特等奖、中国指挥控制协会科技进步一等奖等奖励。

特邀专题简介

空天遥感大数据是通过卫星、无人机、航空器等平台获取的地球表面影像数据，具有覆盖广、时效性强、多模态等特点。随着人工智能技术的突破，遥感大数据的智能处理与可信识别成为研究热点，广泛应用于环境监测、灾害响应、军事侦察等领域。空天遥感大数据的智能处理，包括了图像增强、图像分类、语义分割、目标识别、变化检测等关键技术，而可信识别指的是确保结果可靠、可解释且安全，涉及不确定性量化、模型可解释性、对抗攻击防御等关键技术。空天遥感图像通常数据量大、多源异构、动态变化，提升数据质量、算法泛化性、模型可解释性、处理时效性成为应用发展中的关键问题。

本特邀专题邀请以下与“空天遥感大数据的智能处理与可信识别”主题相

关的包含创新思想、概念、新发现、改进以及新应用的原创论文。

- 遥感图像目标检测识别
- 遥感图像增强
- 遥感图像变化检测
- 遥感图像语义分割
- 多模态遥感图像融合
- 遥感图像智能算法的泛化性增强
- 人工智能算法安全

IEEE ICUS 2025
Invited Session Summary

Title of Session

Intelligent Processing and Trustworthy Identification of Aerospace Remote Sensing Big Data

Organizers

1. Prof. Wen Jiang

Northwestern Polytechnical University, China

2. Dr. Jie Geng

Northwestern Polytechnical University, China

3. Dr. Xinyang Deng

Northwestern Polytechnical University, China

4. **Prof. Jinbiao Zhu**

Aerospace Information Research Institute, Chinese Academy of Sciences

Biosketches of Organizers

Wen Jiang, Professor at Northwestern Polytechnical University, Doctoral Supervisor, National Leading Talent. She serves as the Deputy Director of the Key Laboratory of Aerospace Electronic Information Perception and Optoelectronic Control of the Ministry of Education, the Director of the Chinese Institute of Command and Control (CICC), Vice Chairman of the Information Fusion Committee, Executive Member of the Command and Control Network Committee, and the Member of the Information Fusion Branch of Chinese Society of Aeronautics and Astronautics. She mainly engaged in research on information fusion, uncertain artificial intelligence, and intelligent algorithm security. She has published three academic monographs and authorized 40 invention patents, and over 80 SCI papers, of which 20 have been selected as highly cited or hot topic papers in ESI. As the first completed person, she has won the first prize of CICC Science and Technology Progress Award, the second prize of National Defense Science and Technology Progress Award, and the second prize of Shaanxi Province Science and Technology Award. She was selected as a "Highly Cited Researchers" by Clarivate in 2020 and 2021.

Jie Geng, Associate Professor at Northwestern Polytechnical University, Doctoral Supervisor, and Member of the CICC Youth Working Committee. He mainly engaged in research on SAR microwave remote sensing, artificial intelligence, and multi-source information fusion. He has published more than 40 papers in high-level domestic and international journals such as IEEE Transactions on Geoscience and Remote Sensing, ISPRS Journal of Photography and Remote Sensing, IEEE Transactions on Circuits and Systems for Video Technology, Journal of Automation, and more than 10 authorized invention patents. He has hosted in more than 10 national and provincial level projects, including the National Natural Science Foundation of China, the National Key Research and Development Sub-project, and the Shaanxi Provincial Key Research and Development Program.

Xinyang Deng, Associate Professor at Northwestern Polytechnical University, Doctoral Supervisor, and Members of CICC Youth Working Committee, CICC Information Fusion Committee. His research areas include intelligent algorithms security, multi-source information fusion and so on. He has hosted or participated more than 10 national and provincial level projects including National Natural Science Foundation of China and National Science and Technology Major Project, and published 3 academic monographs and more than 50 academic papers, authorized over 30 invention patents. He has won the first prize of CICC Science and Technology Progress Award, the second prize of National Defense Science and Technology Progress Award, second prize of Shaanxi Province Science and Technology Award, and selected as a "Highly Cited Researchers" by Clarivate.

Jinbiao Zhu, Professor of Engineering at Aerospace Information Research Institute, Chinese Academy of Sciences (CAS), Technical support talents of Chinese Academy of Sciences. He serves as the Deputy Director of the CAS Aviation Remote Sensing Center, Member of the Advanced Avionics 3A Infrastructure Standard Working Group, Standing Member of the Digital Polar Committee of the Chinese National Committee of the International Society for Digital Earth, Standing Member of the Fusion Intelligence and Integrated Science Committee of the Chinese Command and Control Society. He mainly engaged in research on aviation remote sensing technology and applications,

perspective observation radar technology, etc. He has published more than 20 papers, authorized over 40 invention patents, and won the first prize of Beijing Province Science and Technology Progress, the special prize of China Electronics Society Science and Technology Progress, and the first prize of China Command and Control Association Science and Technology Progress.

Details of Session

Aerospace remote sensing big data are acquired by satellite, UAV, aircraft and other platforms with the earth surface data, which has the characteristics of wide coverage, strong timeliness, multi-mode and so on. With the breakthrough of artificial intelligence technology, intelligent processing and trusted identification of remote sensing big data have become a research hotspot, which are widely used in environmental monitoring, disaster response, military reconnaissance and other fields. Intelligent processing of aerospace remote sensing big data includes image enhancement, image classification, semantic segmentation, target recognition, change detection and other key technologies. Trusted identification refers to ensuring that the results are reliable, interpretable and secure, which involves some key technologies such as quantification of uncertainty, interpretability of models, and counterattack defense. Aerospace remote sensing images usually have large amount of data, heterogeneous multi-sources and dynamic changes, so improving data quality, algorithm generalization, model interpretability and processing timeliness have become key issues in application development.

The invited session invites original papers of innovative ideas and concepts, new discoveries and improvements, and novel applications relevant to the following selected topics of “Intelligent Processing and Trustworthy Identification of Aerospace Remote Sensing Big Data”.

- Remote Sensing Image Target Detection
- Remote Sensing Image Enhancement
- Remote Sensing Image Change Detection
- Remote Sensing Image Semantic Segmentation
- Multimodal Remote Sensing Image Fusion
- Increased Generalization of Remote Sensing Intelligent Algorithm
- Security for Artificial Intelligence Algorithm