

IEEE ICUS 2022
Invited Session Summary

Title of Session

Novel Theory, Method and Technology on Autonomous Unmanned Systems

Name, Salutation and Affiliation of Organizers

1. Assoc. Prof. Fei Zhang

Anhui University, China

2. Dr. Dalei Wang

Suzhou University, China

3. Dr. Chengcai Wang

Ocean Information Technology Research Institute Co., Ltd, CETC, China

4. Dr. Hongfei Zhao

Army Research Institute, China

Biosketches of Organizers



Fei Zhang, Ph.D. The associate professor at Anhui University. The member of CICC Youth Committee. Devoted to the teaching and research of numerical analysis, numerical computation complexity, artificial intelligence and other fields for a long time. Published more than 10 papers in Stochastic, Communications In Statistics, IEEE International Conference on Unmanned Systems and other SCI journals and EI conferences. Participated in the fourth ICUS conference and won the best paper award. Presided over or participated in a number of provincial and ministerial natural science funds.



Dalei Wang, lecturer at Suzhou University. The provincial education rookie. September 2021-June 2022, the visiting scholar in University of Science and Technology of China. Researching interests include deep learning, machine learning, artificial intelligence, etc. Published 3 papers in SCI journals such as Computational Intelligence and Neuroscience, Mathematical Problems in Engineering. Applied for 3 national invention patents and authorized 1. In recent years, he has hosted or participated in 2 provincial and ministerial natural science funds and 4 industry-university-research horizontal projects.



Chengcai Wang, Ph.D. Graduated from Peking University. The master of Wang Xiaomo Academician Workstation. The winner of China Association for Science and Technology Young Talent and the China Electronics Technology Group Top Ten Young Talent, obtained more than 50 national patents and published more than 20 high-level papers. He won more than 10 awards, including the champion of Robot Competition, the first prize of Ystar Innovation and Entrepreneurship Competition of Central Enterprise, the champion of Hainan Innovation and the Entrepreneurship Competition, and the International IF Design Award. He is the vice director-general of the Youth Working Committee of Chinese Institute of Command and Control. member of Aircraft Control Committee of Chinese Association of Automation. In recent years, he has presided over or participated in a number of major scientific research projects of the Ministry of Science and Technology of the People's Republic of China, the Committee of Science and Technology of the Central Military Commission, the Department of Science and Technology of Hainan Province, and the Electricity Group and achieved fruitful research results.



Hongfei Zhao, senior engineer of Unit 31605 Army Research Institute. Received the PhD degree in Engineering from PLA University of Science and Technology in 2014. From 2019 to 2021, he was engaged in the unmanned search and rescue system research at postdoctoral station of Nanjing University Jinling Hospital. Published more than 20 papers in the important journals in China and abroad. In recent years, he has presided over or participated in 12 provincial and ministerial scientific research projects. Won one first prize, one second prize and two third prizes of provincial and ministerial level science and technology progress. Authorized 3 national invention patents. Selected into 333 High-level talent Project of Jiangsu Province and several expert talent pools of the army.

Details of Session

With the development of the new-generation artificial intelligence, autonomous unmanned systems have broad application prospects in both military and civil fields, such as aerospace exploration, polar scientific research, deep-sea exploration, UAV patrol, intelligent transportation. The key technologies of autonomous unmanned system involve perception and cognition, navigation and positioning, autonomous decision-making, intelligent control, intelligent testing, human-computer interaction,

etc. Its purpose is to realize the unmanned, intelligent and information technology of autonomous unmanned systems, which is a hot topic of the current academia and industry. In the extreme and harsh complex environment, autonomous unmanned system can break through the physiological limits of human beings and the manual operation is replaced. It has important application value in aerospace exploration, polar research and deep-sea exploration.

This conference will focus on introducing the latest research results of new theories, new methods and new technologies of autonomous unmanned systems. The topics of the session include but are not limited to:

- Perception and cognition of autonomous unmanned system
- Navigation and positioning of autonomous unmanned system
- Modelling, control and estimation of autonomous unmanned system
- Design, manufacturing, testing and reliability evaluation of autonomous unmanned system
- Autonomous decision-making of autonomous unmanned system
- Human-computer interaction of autonomous unmanned systems
- Other artificial intelligence with applications in autonomous unmanned systems