

IEEE ICUS 2022

Invited Session Summary

Title of Session

Design and Evaluation of Intelligent Unmanned Swarm System

Name, Salutation and Affiliation of Organizers

1. Prof. Bing Li

System Engineering Institute of Sichuan Aerospace, China

2. Prof. Tao Wang

National University of Defense Technology, China

3. Dr. Juan Li

Beijing Institute of Technology, China

4. Dr. Xin Zhou

National University of Defense Technology, China

Biosketches of Organizers



Bing Li, male, Ph.D., Senior Engineer, Experts in the System Engineering Institute of Sichuan Aerospace, Selected into the First Out-standing Youth Talent Plan, Visiting Professor of Chengdu University of Technology, Member of the Expert Committee of Sichuan New Standard Rail Gear Transmission Equipment Engineering Research Center. His research interests include unmanned combat equipment system and unmanned system technology. He has been awarded a second prize at the provincial and ministerial level and completed the integration verification and evaluation optimization technology of an unmanned system as the technical director and deputy director of the project office. He also participated in several important projects. He has published 23 high-level international journal papers, 22 patents and co-authored a book.



Tao Wang, male, Ph.D., Associate Professor, Director of the Teaching and Research Center for Strategic Game and Strategic Management, College of Systems Engineering, National University of Defense Technology. His interest is strategic system-of-systems designing and system simulation. He led the team to participate in several major activities, and strongly supporting the decision-making of the head of the agency. He undertook

more than ten major projects, and published dozens of papers in high-level journals.



Juan Li, female, Ph.D., Assistant Professor, her current research interests include intelligent optimization (multi-objective evolutionary optimization, and uncertain optimization), unmanned systems design and integration, swarm intelligence, and autonomous decision-making of large-scale unmanned systems under complex environments. She participated in several

important projects, undertook 4 national and school projects. She has published eight high-level international journal papers, more than ten conference papers and co-authored two books.



Xin Zhou, male, Ph.D., Lecturer, a joint doctoral training to the University of Adelaide, Australia, and stayed at the school to teach in December 2019. His interest is system-of-systems designing and simulation evaluation. Zhou Xin participated in several major activities, undertook 2 national and school projects.

He won the 2020 Outstanding Doctoral Dissertation Award of China Simulation Society, and published more than ten papers in journals and conferences such as IEEE Transactions on Vehicular Technology.

Details of Session

With the accelerated transfer of breakthrough achievements in artificial intelligence to the military field, mission strategies and concepts of unmanned swarm systems marked with information science, biological science, and artificial intelligence are emerging. The design and evaluation of intelligent unmanned Swarm system play an increasingly important role in the system design and are vital means of constructing unmanned systems. With the rapid development of systems engineering and information technology, the systemization trend of modern society, economy and military is becoming stronger and stronger, especially the unmanned swarm system has a wide range of application scenarios. The unmanned swarm system mainly refers to the machine device with intelligence, autonomy and free movement. It is a complex system capable of carrying out tasks constructed with unmanned platforms, mission loads, command and control, and communication networks as the main components, which has the characteristics of high intelligence and informatization.

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 “Design and Evaluation of Intelligent Unmanned Swarm System”.

- Basic theory of large-scale unmanned swarm system
- Unmanned swarm architecture and complex network
- Modelling and simulation technology of unmanned swarm system
- Unmanned swarm system optimization and intelligent decision-making
- Unmanned swarm system evaluation and big data
- Unmanned swarm system engineering and artificial intelligence
- Industrial engineering and smart manufacturing
- Engineering system analysis and evaluation