IEEE ICUS 2022
Invited Session Summary

Title of Session

Cooperative Control of Unmanned Aircraft

Name, Salutation and Affiliation of Organizers

1. Prof. Yongfei Ding

Chinese Aeronautical Radio Electronics Research Institute

2. Prof. Wenhao Wang

Chinese Aeronautical Radio Electronics Research Institute

3. Prof. Guoliang Liu

Chinese Aeronautical Radio Electronics Research Institute

4. Prof. Jun Zhao

Chinese Aeronautical Radio Electronics Research Institute

Biosketches of Organizers

Prof. Yongfei Ding, male, vice director of Chinese Aeronautical Radio Electronics Research Institute, chief technology specialist of Aviation Industry of Corporation of China, leading talent of Shanghai, specialist of China equipment development department in unmanned system group, paid by the State Council, and served in several academic committee .He has long been engaged in the study of avionic communication and navigation technology, serve as project chief engineer in the project of high speed optical fiber bus, avionic broadband information transmission system, UAV measurement and control system, onboard collision avoidance system and UAV common ground control station. He is rewarded for the outstanding contribution prize of equipment advance research, Shanghai excellent young expert of post, personal first-class merits of AVIC, first and second prize of national defense prize for progress in science and technology, first and second prize of AVIC prize for progress in science and technology, published more 10 papers in the core journal and more 20 patents.

Prof. Wenhao Wang, department director of Chinese Aeronautical Radio Electronics Research Institute. He has long been engaged in the study of architecture design, UAV command and control system design, UAS cooperative control technology, has deep understanding in the area of UAV ISRK cooperative system, manned and unmanned cooperative control, UAS cooperative control and integration of UAV and network information system, achieved common control of different middle-sized and large-sized UAVs with command and control system, rewarded several prizes of AVIC prize for progress in science and technology, twice personal merits, published several industry standards and more than 20 patents and papers.

Prof. Guoliang Liu, vice chief designer of Chinese Aeronautical Radio Electronics Research Institute. He has long been engaged in the area of UAV command and control, got rewarded the first prize of national defense prize for progress in science and technology, once first prize, twice second prizes, third prize once of AVIC prize for progress in science and technology, personal third-class merits, and silver prize of central enterprise youth innovation prize, and gave great contribution of unmanned equipment construction in the new era.

Prof. Jun Zhao, specialist of AVIC in the area of net and information, vice chief designer of Chinese Aeronautical Radio Electronics Research Institute, mainly majored in UAS command and control, mission planning, sensor information fusion etc.; He presided several vital advance research projects and UAV command and control station projects, and has rich engineering experience in the area of UAV mission planning, controlling, sensor information progressing and UAS communication, composed two national military standard, published more 10 invention patents, rewarded first prize of national defense prize for progress in science and technology, personal merits, first prize of the whole army Maker competition in mission planning, and conducted several technological achievements of AVIC.

Details of Session

With the rapid development of avionics, the unmanned aircraft system is advancing in a systematic, network-based and intelligent way. Therefore, the

unmanned aircraft system is deeply changing the landscape of wars in the future, which makes it an essential component of the future warfare and widely applied in various aspects including target reconnaissance, fire attacking, communication support and electronic countermeasures.

The invited session which targeted at typical requirements of the tasks and taking advantage of the low cost, no casualty and long continuous working hours of the unmanned aircraft, conducts research on the cooperative control to address the problem of weak single-point ability, weak survivability and vulnerability, improves the combat ability and enriches its applications. The cooperative control of unmanned aircraft focuses on optimizing unmanned aircraft mission planning and decision-making under complex confrontation environment, improving cross-platform interoperability, giving full play to the cooperative advantages of cluster unmanned aircrafts, exploring the air-ground cooperative combat mode, optimizing the unmanned aircraft ground station design, and strengthening the application of intelligent technology in information processing. It is the key to improve the operational efficiency, survivability and system confrontation capacity of UAV under complex environment. In addition, the research on the cooperative control of the unmanned aircraft is the key to improving the operational efficiency, survivability and system confrontation capacity of unmanned aircraft under complex environment.

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 “Cooperative Control of Unmanned Aircraft”.

- Interoperability architecture of unmanned system
- Cooperative mission planning of multi unmanned aircraft
- Clustering control of unmanned system
- Cooperative information fusion of multi unmanned aircraft
- Cooperative control of manned/unmanned aircraft
- Cooperative control of cross-domain unmanned system
- Close air support of unmanned aircraft system
- Antisubmarine of unmanned aircraft system
- Ground station design of unmanned aircraft (including control, communication, take-off and landing, intelligence processing etc.)