IEEE ICUS 2022
Invited Session Summary

Title of Session

Intelligent Navigation and Advanced Information Fusion Technology

Name, Salutation and Affiliation of Organizers

1. Prof. Yulong Huang

Harbin Engineering University, China

2. Prof. Yonggang Zhang

Harbin Engineering University, China

Biosketches of Organizers

Yulong Huang is the Professor at the College of Intelligent Science and Engineering, Harbin Engineering University, the Deputy Director of Heilongjiang Engineering Laboratory of Navigation Instruments. He has been devoted to the long-term research of intelligent navigation and intelligent information fusion. Huang Yulong has published more than 60 papers as the first author or the corresponding author, including more than 30 papers in IEEE Transactions, 3 papers with ESI high 1% citation rate.He was the recipient of the Wu Wen-Jun AI Excellent Youth Scholar Award in 2021, the First Prize of Natural Science Award of Chinese Association of Automation (Ranked the 2nd) in 2021, the excellent doctoral thesis from Chinese Association of Automation in 2019, the Honorable Mention of IEEE Barry Carlton Award in 2021, and selected into the 6th Young Elite Scientists Sponsorship Program by China Association for Science and Technology, Hong Kong Scholars Program in 2019, “Positive and Kind-hearted Young People” of Heilongjiang Province in 2020. He serves as an Associate Editor for the IEEE TAES and the IEEE Sens. J., and a Youth Editor for the IEEE/CAA JAS, the Journal of Marine Science and Application, the Unmanned Systems Technology and the Journal of Unmanned Undersea Systems, and a Guest Editor for the IET CSR.

Yonggang Zhang is a Professor of College of Intelligent Science and Engineering, Harbin Engineering University. He is also the Director of Heilongjiang Engineering Laboratory of Navigation Instruments, deputy Director of Navigation Instrument Engineering Center of the Ministry of Education, and Member of Chinese Society of Inertial Technology. His main research areas include navigation technology and information fusion. He has

published more than 170 academic papers as the first author/corresponding author. He was the recipient of the First Prize of Natural Science Award of Chinese Association of Automation, the First prize of national defense technology invention, and First prize of Heilongjiang technological invention. He won the national and provincial talent awards, and also the award of excellent doctoral thesis supervisor from Chinese Association of Automation.

Details of Session

Navigation technology provides accurate position, velocity and attitude information for the unmanned system, which is the key to determine whether it can reach the predetermined location accurately, complete the task smoothly and return safely. It has always been a research hotspot in the field of unmanned systems. In recent years, with the continuous development of the principle and manufacturing technology of navigation sensors, a large number of low-cost, small size, low power consumption, and intelligent navigation sensors have been developed, which provides the possibility for obtaining different types of navigation data. We encounter the challenge how to obtain reliable and high-accuracy estimates of navigation parameters from multi-navigation sensor data in the complex operation environment of unmanned systems. This special session will discuss the latest progress and important breakthrough of intelligent navigation and advanced information fusion technology, and promote the communication and development of unmanned system navigation. It is planned to invite many original and novel high-level academic papers, mainly including the following research topics (but not limited to the following topics) :

1. Inertial navigation, satellite navigation, acoustic navigation, integrated navigation and other traditional navigation technologies;
2. All source navigation, cooperative navigation, visual inertial navigation, SLAM and other intelligent navigation technologies;
3. Multi-sensor information fusion, distributed estimation, state estimation and other advanced information fusion technologies;
4. Machine learning technologies in navigation fields, such as variational learning, Gaussian process learning, and deep learning.