ICIRA 2023 Special Session Proposal

Title of the Proposal: Oceanic Environmental Perception and Operation Robot

Technical Outline of the Session and Topics:

Outline of the Session:

There are abundant resources in the ocean. It is the material foundation of human being's continuous development. A relevant number of oceanic detection and field operations have been carried out including scientific exploration, environmental inspection, marine rescue, through oceanic robots. On the other hand, oceanic robots are special type of robots in complicated environment. They have to confront with high pressure, limited observation and communication conditions, which cause great difficulties in the application of robotic technology in the oceanic operations. Currently, the challenges of oceanic robot include multimodal fusion detection, underwater autonomous manipulation, cooperative detection and operation, surface high speed cruise and obstacle avoidance, cross territory sensing and operation, long time seabed residence charging and docking technology, etc.

Topics of the Session:

- *Surface unmanned vehicles*
- *Oceanic environmental perception*
- *Remotely operated vehicles*
- *Autonomous underwater vehicles*
- *Autonomous underwater manipulations*
- *New concept oceanic robot*
- *Swarm intelligence and cooperative control for oceanic robots*

Contact details of the Session Organizers

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Huanghai received the B.Sc., M.Sc. and Ph.D. degrees in mechanical engineering and Mechatronics from Harbin Institute of Technology (HIT), Harbin China, in 2001,2003 and 2008, respectively. He is currently a professor at the School of Ship Engineering, Harbin Engineering University. His research interests include underwater robot and manipulation technique. As the first and communicating author, he has published more than 35 SCI indexed papers. He also has applied or been granted for more than 30 patents for inventions. He has been in charge of NSFC key project and NSFC Union key project. He has participated as Special Committee Members in three associations of Chinese Marine Technology Society and Automation Society.

Dr. Shaolong Yang, Associate Professor, School of Naval Architecture and Ocean Engineering, Huazhong University of Science and Technology (HUST). His research interests include path planning and intelligent control of marine crafts. He has published co-authored 33 papers and has been granted 30 patents for inventions. He also has been in charge of research projects with funding of over 6 million RMB. He serves as the guest editors for the International Journal of Vehicle Design, and the editorial member for International Journal on Marine Navigation and Safety of Sea Transportation. Also, he is the reviewers for International Journal of Intelligent Robotics and Applications, Ocean Engineering, Soft Computing, Journal of Automatica Sinica.

Shouxu Zhang received the B.Sc., M.Sc. and Ph.D. degrees in mechanical engineering and automatic control from Northwestern Polytechnical University (NWPU), Xi'an, China, in 2012, 2014 and 2017, respectively. He visited University of California, Riverside, America, from 2014 to 2016. Dr. Zhang is currently an associate professor at the School of Marine Science and Technology, Northwestern Polytechnical University. His research interests include multi-agent systems, nonlinear systems and biomimetic robots. He regularly published papers in top journals including Automatica, IEEE Transactions on Cybernetics, IEEE Transactions On Systems, Man, And Cybernetics: Systems, Journal of the Franklin Institute, etc. He received the second prize of Natural Science Award of Shaanxi Province and the first prize of Shaanxi University Science and Technology in 2020. Additionally, he participated in the The 13TH ASIAN CONTROL CONFERENCE ASCC as a Session Organizer in 2022.