ICTTE 2022 Conference

Keynote Speech

Biomimetic Amphibious Spherical Father-son Underwater Robots

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Abstract:

Bio-inspired underwater microrobots with multiple degrees of freedom (DOF) that can walk and swim smoothly in water or aqueous media are of great interest for underwater monitoring operations including pollution detection, video mapping, exploration of unstructured underwater environments, and other tasks. This kind of microrobot must be simple and compact and must have an efficient system of locomotion. Our project aims at the development of a compact and multi-functions for microrobot, inspired by the stick insect, we developed a father-son robot system that can be used in a wide range of underwater applications. In this talk I will describe the State of the art for biomimetic underwater robots, research purposes and research approaches, basic research concepts of biomimetic underwater robots with multi DOFs, design of the spherical underwater robot and multiple robots' system, father-son underwater robot systems.

Shuxiang Guo (IEEE SM'03-F'21) received the Ph.D. degree in Mechano-Informatics and Systems from Nagoya University, Japan, in 1995. He is currently a Full Professor with the Faculty of Engineering and Design, Kagawa University, Takamatsu Japan. He is also Chair professor with the Key Laboratory of Convergence Medical Engineering System and Healthcare Technology, the Ministry of Industry and Information Technology, Beijing Institute of Technology, Beijing, China. He is a Fellow (Guest Member) of Engineering Academy of Japan, and IEEE Fellow. His research focuses on biomimetic underwater robots, medical robot systems for minimal invasive surgery, micro catheter system, micro-pump, and smart material (SMA, IPMC) based on actuators. He has published about 500 refereed journal and conference papers, received over 15 IEEE Conference best paper awards.

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