



The 16th International Conference on Intelligent Robotics and Applications (ICIRA 2023)

July 5-7, 2023 in Hangzhou, China

ICIRA 2023 Special Session Proposal

Title of the Proposal: Wearable Sensors and Robots

Technical Outline of the Session and Topics:

Outline of the Session: In recent years, relying on highly developed wearable sensor technology and intelligent processing methods, great breakthroughs have been achieved in the perception accuracy, modal and delays of human physical and physiological data. Based on this, the researchers have realized the natural interaction in the highly coupled human-robots system, so that the robots can complete tasks such as fetching objects, walking assistance, and daily services according to human intention. This special session focuses on the cutting-edge work and innovative achievements of wearable sensors in the field of improving robot operation intelligence and interaction friendliness.

Topics of the Session:

- *Sensing integrated innovation: how to realize the high-precision, high-dimensional, high real-time and portable perception of kinematics and dynamics data of human-robot system through lightweight and low-latency wearable sensor network.*
- *Clinical application: Combining the latest machine learning processing methods and the knowledge system of clinical experts to achieve rehabilitation effects through robots.*
- *Human-adapted control: Combined with the latest control laws, design a control method suitable for human-robots system, which can achieve high real-time precise control and significantly reduce the risk of harming humans.*

Contact details of the Session Organizers

- *Organizer 1: Tao Liu, Zhejiang University, liutao@zju.edu.cn*
- *Organizer 2: Yinlai Jiang, University of Electro-Communications, jiang@hi.mce.uec.ac.jp*
- *Organizer 3: Joao Paulo Ferreira, University of Coimbra, ferreira@isec.pt*

Tao Liu (Senior Member, IEEE) received the Ph.D. degree in engineering from the Kochi University of Technology, Kochi, Japan, in 2006. He has been an Assistant

Professor with the Department of Intelligent Mechanical Systems Engineering, Kochi University of Technology, from 2009 to 2013. He is currently a Professor with the State Key Laboratory of Fluid Power Transmission and Control, School of Mechanical Engineering, Zhejiang University, China. His current research interests include wearable sensor systems, rehabilitation robots, biomechanics, and human motion analysis. He was a recipient of the Japan Society of Mechanical Engineers Encouragement Prize in 2010. In 2013, he received the Chinese Recruitment Program of Global Youth Experts.

Yinlai Jiang (M'09) received the B.S. and M.S. degrees in computer science and technology from the Northeastern University, China, in 2002 and 2005, and the Ph.D in engineering from Kochi University of Technology, Japan, in 2008. He was a research associate from 2008 to 2012, and an assistant professor from 2013 to 2014 in Kochi University of Technology. He is currently an associate professor with the Center for Neuroscience and Biomedical Engineering, the University of Electro-Communications. His current research interests biological engineering, robotics, and human robot interface.

Joao Paulo Ferreira, PhD

João P. Ferreira received his PhD in Instrumentation and Control in 2010 from the Univ. of Coimbra, Portugal. Currently, he is a Coordinator (Associate) Professor of the Electrical Engineering Department at the Superior Institute of Engineering of Coimbra, Coordinator of specialization course of Industrial Automation, Robotics and Maintenance and Researcher at the Institute of Systems and Robotics of Univ. of Coimbra. He has coordinated and participated in several funding projects in the area of humanoid and medical rehabilitation robotics, with more than hundred scientific publications in international journals/conferences, over than three hundred participations as a reviewer of scientific manuscripts and have a national patent (n°. 108143). His research interests include robotics, humanoid robots, human gait, rehabilitation robotics and artificial intelligence and its application.