



ICIRA 2023 Special Session Proposal

Title of the Proposal: Clinically Oriented Design in Robotic Surgery and Rehabilitation

Technical Outline of the Session and Topics:

Outline of the Session: The booming clinical success of commercial robotics is the outcome of continuous efforts in translational research on novel medical devices, which starts with a rough idea driven by clinical needs or challenges and targets its long-term translation into a clinically approved device. The aim of session is to engage the clinical/robotics community to present the latest scientific achievements in terms of translation of medical robots to clinical practice from robotic surgery to robotic rehabilitation. Topics of the Session:

- *Physiological signal sensing and processing*
- *Mechanical design of surgical and rehabilitation robots*
- *Actuation and control design of surgical and rehabilitation robots* • *Clinical evaluation of surgical and rehabilitation robots*

Contact details of the Session Organizers

- *Organizer 1: Ning Jiang, West China Hospital Sichuan University, jiangning21@wchscu.cn*
- *Organizer 2: Kang Li, West China Hospital Sichuan University, likang@wchscu.cn*

Ning Jiang received his B.S. degree in electrical engineering from Xi'an Jiaotong University, Xi'an, China, in 1998, and his M.Sc. and Ph.D. degrees in engineering from the University of New Brunswick, Fredericton, NB, Canada, in 2004 and 2009, respectively. He had research and academic positions in Denmark, Germany, and Canada before he was promoted to tenured associate professor at the Department of

Systems Design Engineering at the University of Waterloo, Canada. He also held a Canadian Research Chair (Tier II) in artificial intelligence and human-machine interface. He is currently a full professor at the West China Hospital Sichuan University, Sichuan, China. His research interests include signal processing of physiological signals, such as electromyography, electroencephalogram, and electrocardiography, as well as advanced prosthetic control, neuromuscular modeling and brain-computer interfaces, with a focus on neurorehabilitation applications. He is currently Associate Editors for IEEE Journal of Biomedical and Health Informatics, IEEE Transactions on Neural Systems and Rehabilitation, the Brain Computer Interface, Frontiers in Neuroscience, and Journal of Neuroscience Methods.

Kang Li received the Ph.D. degree in Mechanical Engineering from University of Illinois at Urbana Champaign, Champaign, IL, USA, in 2009. He is now a full professor of the Biomedical Big Center at West China Hospital and Associate Dean for Research at Sichuan University Pittsburgh Institute. Before joining West China Hospital, He was an associate professor with the Department of Orthopaedics, Rutgers New Jersey Medical School (NJMS) and an assistant professor with Department of Industrial and Systems Engineering, Rutgers University. He serves as an associate editor of IEEE Transactions on Human-Machine Systems and BMC Musculoskeletal Disorders. His research interests include AI in healthcare, musculoskeletal biomechanics, medical imaging, design and biorobotics, and human factors/ergonomics.