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Web X Presentation Seminar:
Dr. Hongliang Ren, National University of Singapore
Human-Centered Surgical Robotics with Contiuum, Compliance, Collaboration and Cognition
Tuesday, February 20th, 11AM, 202 ECEC

Abstract: Representing a major paradigm shift from open surgery, minimally invasive surgery (MIS) assisted by robotics and sensing is emerging by accessing the surgical targets via either keyholes or natural orifices. It is challenging to get delicate and safe manipulations due to the constraints imposed by the mode of robotic access, confined workspace, complicated surgical environments and the limited available dedicated technologies, particularly in terms of endoluminal curvilinear targeting and curvilinear guidance. Addressing the aforementioned challenges and aiming at human-centered flexible minimally invasive robotic systems, we focus on the key biorobotics research in continuum robotic system development, compliant robotic modeling & control, collaborative human-robot interaction, cognitive sensing and intelligent navigation, which are tackling fundamental and technical challenges mostly in the context of MIS applications.

Bio:

Hongliang Ren is currently an assistant professor and leading a research group on medical mechatronics in the Biomedical Engineering Department of National University of Singapore (NUS). He is an affiliated Principal Investigator for the Singapore Institute of Neurotechnology (SINAPSE), NUS (Suzhou) Research Institute, and Advanced Robotics Center at National University of Singapore (NUS). Dr. Ren received his PhD in Electronic Engineering (Specialized in Biomedical Engineering) from The Chinese University of Hong Kong (CUHK) in 2008. Prior to joining NUS, he worked as a Research Fellow in The Johns Hopkins University, Children's Hospital Boston & Harvard Medical School, and Children's National Medical Center, USA. His main areas of interest include Biorobotics & Intelligent Control, Medical Mechatronics, Computer-Integrated Surgery, and Multisensor Data Fusion in Surgical Robotics. Dr. Ren is IEEE Senior member and currently serves as Associate Editor for IEEE Transactions on Automation Science & Engineering (T-ASE) and Medical & Biological Engineering & Computing (MBEC).