Biography:

Dr. Bin Zi is a Professor with School of Mechanical and Automotive Engineering, and Director of the Robotics Institute at Hefei University of Technology, China. He received the Ph.D. degree from Xidian University, China, in 2007. China. From 2011 to 2012 he worked as a visiting scholar with Chair of Mechanics and Robotics, University of Duisburg-Essen, Germany. In 2015, he worked as a visiting professor at the University of Ontario Institute of Technology, Canada. He has published more than 70 journal and conference publications, 1 book and 1 book chapter. He has more than 50 patents for his inventions. His research interests include cable-driven parallel robots, robotics and automation, mechatronics, and multirobot systems.

Title of Speech: <u>Design, analysis and control of cable-suspended parallel robots and its applications</u>

Abstract:

Cable-suspended parallel robots are promising alternative of traditional rigid-link parallel mechanisms in which cables are used to manipulate objects instead of rigid links for simple and light-weight structure, large reachable workspace, high acceleration capability, and easy reconfigurability. Different aspects like time optimal trajectory tracking, workspace, integrated mechanism design and control, and design of a new CPMs for large-scale manipulation were investigated extensively.

This talk focuses on the design, mechanics, control, development and applications of cable-suspended parallel robots. Some typical mechanical architectures of cable-suspended parallel robots in practical applications are provided and analyzed in this talk, including the feed cable-suspended structure for super antenna, the hybrid-driven based cable-suspended parallel robot and the cooperative cable parallel manipulators for multiple mobile cranes. On the basis of the typical applications, the fundamental mechanics, obstacle avoidance planning and coordinate control of cable-suspended parallel robots are addressed. Numerical analyses and experiments of related case studies are also conducted.