Invited Keynote Speech | ICIRA2019

Talk: From Automation to Learned Autonomy - A New Era for Intelligent Robots

Abstract: The scientific goal of robot locomotion and manipulation is to develop machines to traverse various terrains, deliver payload, and perform manipulation tasks with a mixed level of autonomy: from remote control to fully autonomous operation. This talk will cover main research challenges in control, planning, and machine learning, and the innovation of these research domains that can make a step change for solving real-world problems. Particularly, I will showcase some new results from deep reinforcement learning combined with control and optimization in a hierarchical framework to self-learn goal-oriented policies on various locomotion, dexterous manipulation & grasping tasks. All these technologies are the building blocks for outdoor inspection, disaster response, and can further revolutionize the supply chain (warehouse picking & packing, last-mile delivery), search & rescue, infrastructure maintenance, and space robotics.

Biography: Dr. Zhibin Li is a Lecturer (Assistant Professor) at the School of Informatics, the University of Edinburgh. During 2013 to 2015, Dr Li participated in the DARPA Robotics Challenge (DRC) Finals as part of the WALK-MAN DRC team, contributing to the control and development of a full-size humanoid robot WALK-MAN. Dr Li has rich experience in working with real robot platforms, and has built strong expertise in the areas of force & compliance control, optimisation based motion planning and whole-body control, and machine learning for achieving dynamic motions and intelligent behaviour of high-DoF robots.

He is now the head of Advanced Robotics Lab and his research focuses on a variety of control technologies - control, optimisation and machine learning - for solving challenging problems in dynamic motion control (manipulation, grasping, locomotion), and complex behaviours of mobile (wheeled & tracked) and legged robots (quadruped & humanoid). His has current research projects on: autonomous robotic manipulation by data-efficient learning; mulit-contact whole-body motion planning; deep learning of robot locomotion; visual-haptic immersive tele-operation; autonomous stair-climbing of logistic/delivery robots; soft robotic gripper for handling fragile objects.