

Distinguished Seminar in Robotics, Systems & Control

The Institute of Robotics and Intelligent Systems presents:

Shared Autonomy: The Future of Interactive Robotics

Date: February 22, 2019

Time: 15.15

Place: HG G3

Abstract:

The next generation of robots are going to work much more closely with humans, other robots and interact significantly with the environment around it. As a result, the key paradigms are shifting from isolated decision making systems to one that involves shared control -- with significant autonomy devolved to the robot platform; and end-users in the loop making only high level decisions. This talk will briefly introduce powerful machine learning technologies ranging from robust multi-modal sensing, shared representations, scalable real-time learning and adaptation and optimal scheduling of compliant actuation that are enabling us to reap the benefits of increased autonomy while still feeling securely in control. This also raises some fundamental questions: while the robots are ready to share control, what is the optimal trade-off between autonomy and control that we are comfortable with? Domains where this debate is relevant include self-driving cars, offshore asset inspection and maintenance, deep sea and autonomous mining, shared manufacturing, exoskeletons/prosthetics for rehabilitation as well as smart cities to list a few.

Biography:

Sethu Vijayakumar is the Professor of Robotics in the School of Informatics at the University of Edinburgh and the Director of the Edinburgh Centre for Robotics. He holds the prestigious Senior Research Fellowship of the Royal Academy of Engineering, co-funded by Microsoft Research and is also an Adjunct Faculty of the University of Southern California (USC), Los Angeles. Professor Vijayakumar, who has a PhD (1998) from the Tokyo Institute of Technology, has pioneered the use of large scale machine learning techniques in the real time control of several iconic large degree of freedom anthropomorphic robotic systems including the SARCOS and the HONDA ASIMO humanoid robots, KUKA-DLR robot arm and iLIMB prosthetic hand. His latest project (2016) involves a collaboration with NASA Johnson Space Centre on the Valkyrie humanoid robot being prepared for unmanned robotic pre-deployment missions to Mars. He is the author of over 180 highly cited publications in robotics and machine learning and the winner of the IEEE Vincent Bendix award, the Japanese Monbusho fellowship, 2013 IEEE Transaction on Robotics Best Paper Award and several other paper awards from leading conferences and journals. He has led several UK, EU and international projects in the field of Robotics, attracted funding of over £38M in research grants over the last 8 years and has been appointed to grant review panels for the DFG-Germany, NSF-USA and the EU. He is a Fellow of the Royal Society of Edinburgh and a keen science communicator with a significant annual outreach agenda. He is the recipient of the 2015 Tam Dalyell Award for excellence in engaging the public with science and serves as a judge on BBC Robot Wars and was involved with the UK wide launch of the BBC micro:bit initiative for STEM education. He has recently taken on the role of the Co-Program Director of The Alan Turing Institute, driving their Robotics and Autonomous Systems agenda.

Webpage: <http://homepages.inf.ed.ac.uk/svijayak>

