ETHzürich

Distinguished Seminar in Robotics, Systems & Control

The Institute of Robotics and Intelligent Systems presents:

Telerobotic Touch

Date: June 1, 2018
Time: 15.15
Place: HG G3

Abstract:

Today's robots developed from mechanical master-slave devices that enabled a human to capably manipulate hazardous items from a behind a safety barrier. When creating modern teleoperation systems for work across different length scales and inter-site distances, one cannot simply replace the mechanical teleoperator connection with an electrical or computational one: making the slave robot track the master interface is straightforward, but letting the operator feel forces and torques from the remote site tends to drive the loop unstable. The consequently common approach of omitting haptic feedback severely limits the utility of such systems, particularly for new users. My team has addressed the absence of telerobotic touch feedback from several perspectives, repeatedly demonstrating that naturalistic tactile cues (as opposed to the kinesthetic cues that are typically studied) greatly enhance system usability and increase operator performance without compromising stability. This talk will showcase examples from our research on minimally invasive robot-assisted surgery and household robotics while also highlighting related insights about how to endow autonomous robots with haptic intelligence.

Biography:

Katherine J. Kuchenbecker directs the Haptic Intelligence Department at the Max Planck Institute for Intelligent Systems in Stuttgart, Germany. She was previously an Associate Professor of Mechanical Engineering and Applied Mechanics at the University of Pennsylvania, where she held the Class of 1940 Bicentennial Endowed Term Chair and a secondary appointment in Computer and Information Science. Kuchenbecker earned her Ph.D. in Mechanical Engineering at Stanford University in 2006 and did a postdoctoral fellowship at the Johns Hopkins University. Her research centers on haptic interfaces, which enable a user to touch virtual and distant objects as though they were real and within reach, as well as haptic sensing systems, which allow robots to physically interact with objects and people. She delivered the RSS Early Career Talk in 2009 and a TEDYouth talk on haptics in 2012, and she has received several honors including a 2009 NSF CAREER Award, the 2012 IEEE Robotics and Automation Society Academic Early Career Award, a 2014 Penn Lindback Award for Distinguished Teaching, and various best paper and best demonstration awards.

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