Co-Robotics

Session Co-chairs: Brian Gerkey (Open Source Robotics Foundation) and Carmel Majidi (Carnegie Mellon University)

Historically, robots have been engineered as heavy industrial machinery for repetitive tasks like welding, painting, and machining. These industrial robots are not typically designed for human interaction and can only be operated by a trained specialist in a controlled factory environment. However, recent advancements in robotics technology have enabled safer interaction with humans and allowed robots to enter our workplaces, hospitals, and homes. These new generation of medical and service robots assist and cooperate with humans in a broad range of "co-robotics" tasks, from teleoperated minimally invasive surgery to inventory handling and household cleaning. Advancements in robot control and automation have also led to self-driving cars, UAVs, and other autonomous vehicles technologies that have the potential to revolutionize transportation, space exploration, and natural disaster relief. As these non-traditional applications of robotics continue to grow, further advancements will increasingly focus on fundamental challenges that are unique to co-robotics. These include progress in not only robotics technology but also the social, behavioral, and economic aspects of human-robot interaction.

This session will begin with a talk by Chris Urmson (Google), who leads Google's program for self-driving cars, which have driven over 400,000 miles on California roads. Next, Matthew Williamson (Rethink Robotics) will present a comprehensive overview of the hardware and software required to build a robot that can safely interact with humans and be trained to perform repetitive tasks in a manufacturing environment. The third speaker, Allison Okamura (Stanford University) will present her work on the next generation of minimally invasive surgical robotics. These robots can be designed, manufactured, and controlled spontaneously for a specific patient and procedure. The final presentation will be by Dennis Hong (University of California, Los Angeles), who will talk about biologically inspired mobile robots.