学术报告会

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Robots in Harmony with Humans

David Hsu

National University of Singapore, Singapore

Abstract:

At just over 50 years old, robotics is rejuvenated and embarking on a new journey. Early robots often occupied tightly controlled environments, e.g., factory floors, designed to segregate robots and humans for safety. Today robots "live" with humans, providing a variety of services at homes, in workplaces, or on the road. To become effective and trustworthy collaborators, robots must understand human intentions and act accordingly in response. One core challenge here is the inherent uncertainty in understanding intentions, as a result of the complexity, diversity, and dynamics of human actions. Robots must hedge against such uncertainties in order to act robustly and sometimes actively elicit information in order to reduce uncertainty and ascertain human intentions. In this talk, we will explore planning and learning under uncertainty for human-robot interactive or collaborative tasks. I will discuss our recent work, covering mathematical models for human intentions, planning algorithms that connect robot perception with decision making, and learning algorithms that enable robots to adapt to human preferences, and apply them to autonomous vehicle navigation and human-robot object handover. The discussion, I hope, will spur greater interest in the community towards principled approaches that integrate perception, planning, and learning for fluid human-robot collaboration.

Biography:

David Hsu is a professor of computer science at the National University of Singapore, a member of NUS Graduate School for Integrative Sciences & Engineering and deputy director of the Advanced Robotics Center. His current research focuses on robotics and AI. He received B.Sc. in computer science & mathematics from the University of British Columbia, Canada and Ph.D. in computer science from Stanford University, USA. After leaving Stanford, he worked at Compaq Computer Corp.'s Cambridge Research Laboratory and the University of North Carolina at Chapel Hill. At the National University of Singapore, he held the Sung Kah Kay Assistant Professorship and was a Fellow of the Singapore-MIT Alliance. He served as the associate editor of IEEE Transactions on Robotics and as the program chair of Robotics Science & Systems (RSS) 2015. He is currently serving on the editorial board of Journal of Artificial Intelligence Research and as the general co-chair of IEEE International Conference on Robotics & Automation (ICRA) 2016.