

University of Rochester
Department of Electrical and Computer Engineering Colloquia

At the Intersection of Robot Planning and Natural Language Understanding

Thomas Howard

Thursday, February 27th
12:30 PM – 1:30 PM
Goergen 101

Abstract:

Contemporary examples of autonomous robots exhibit enough intelligence to drive cars in human environments, manipulate objects on assembly lines, and explore distant planets. This performance is however often the result of significant engineering and algorithms that rely on strict simplifying assumptions that fail to extrapolate to more difficult scenarios. Adaptability of planning algorithms to novel tasks and environments is necessary for robots to meet or exceed human performance in domains such as manufacturing, agriculture, and exploration. Two key factors that influence the performance of planning algorithms are the representation of the decision space and the methods for searching it. In this talk, I will discuss my research towards improving the feasibility, optimality, and efficiency of robot decision spaces and present a new probabilistic model for inferring the formulation of robot planning problems from natural language instructions. Throughout the seminar I will highlight applications of my research on planetary rovers, field robots, autonomous automobiles, mobile manipulators, and robotic torsos. The talk will conclude with a presentation of my vision for how the amalgamation of robot planning, natural language understanding, and machine learning will improve the scalability of intelligent cyber-physical systems.

Biographical Sketch:

Thomas Howard is a Research Scientist in the Computer Science and Artificial Intelligence Laboratory at the Massachusetts Institute of Technology. Dr. Howard's research centers on robot intelligence in complex, unstructured environments with a specific focus on motion planning and natural language understanding. Previously, he was a Research Technologist II at the Jet Propulsion Laboratory and a Lecturer in Mechanical Engineering at the California Institute of Technology. He earned his Ph.D. in Robotics from Carnegie Mellon University in 2009 and his B.S. degrees in Mechanical Engineering and Electrical and Computer Engineering from the University of Rochester in 2004.

Light refreshments will be provided.