

Dr. Manuela Veloso
Symbiotic Autonomy for Effective Service Robots

Abstract

We envision ubiquitous autonomous mobile robots that can help and cohabitate with humans performing tasks to service humans. Such robots are still far from common, as our environments offer great challenges to robust robot perception, cognition, and action. In this talk, I present a significant step to move us closer to our ultimate goal, namely our novel symbiotic autonomy: robots are aware of their limitations and proactively ask for help from humans or access the web. Such symbiotic autonomy has enabled our CoBot robots to move daily in our multi-floor buildings performing a variety of service tasks, including escorting visitors and transporting packages between locations. I will describe CoBot's fully autonomous effective mobile robot indoor localization and navigation algorithms, its human-centered task planning, and its symbiotic interaction with the humans and with the internet. I will further introduce the multi-robot task scheduling algorithm for our multiple CoBots, discuss CoBot's semi-autonomous telepresence behavior, and describe our ongoing research on grounding of speech and language for the robot interaction with users. The talk will be illustrated with results and examples from many hours-long runs of the robots in our buildings. This is joint work with Joydeep Biswas, Brian Coltin, Stephanie Rosenthal, and Thomas Kollar.

Bio

Manuela M. Veloso is Herbert A. Simon Professor of Computer Science at Carnegie Mellon University. She has courtesy Professor appointments in the Robotics Institute, in the Machine Learning Department, in the Electrical and Computer Engineering Department, and in the Mechanical Engineering Department. Professor Veloso founded and directs the CORAL research laboratory, for the study of multiagent systems where agents Collaborate, Observe, Reason, Act, and Learn, www.cs.cmu.edu/~coral. Professor Veloso is Fellow of IEEE, Fellow of AAAS (American Association for the Advancement of Science), and Fellow of AAAI (Association for the Advancement of Artificial Intelligence). She is the President-Elect of AAAI and she was the President of the RoboCup Federation for the last three years, and of which she continues to be a member of the Board of Trustees. Professor Veloso was recently recognized by the Chinese Academy of Sciences as Einstein Chair Professor. She also received the 2009 ACM/SIGART Autonomous Agents Research Award for her contributions to agents in uncertain and dynamic environments, including distributed robot localization and world modeling, strategy selection in multiagent systems in the presence of adversaries, and robot learning from demonstration. Professor Veloso is the author of one book on "Planning by Analogical Reasoning" and editor of several other books. She is also an author in over 280 journal articles and conference papers.