Manuela Veloso

Autonomous Mobile Robots Coexisting with Humans in Indoor Environments

Wednesday, 18th August, 2010, Room 3.2.14

We envision ubiquitous autonomous mobile robots that can help and coexist with humans. Such robots are still far from common, as our environments offer great challenges to robust robot perception, cognition, and action. We realize the envisioned robot and human coexistance as offering a symbiotic human-robot interaction, such that we view robots and humans with complementary limitations and expertise. I will present CoBot, our visitor's companion robot that can provide guidance to visitors unfamiliar with the building, while it can also identify and overcome its limitations by asking for human help. I will present CoBot's effective mobile robot indoor localization and navigation algorithms that use a WiFi signature perceptual map combined with geometric constraints of the building. I will illustrate CoBot's performance with examples of a few autonomous hours-long past runs of the robot in Wean Hall and very recent runs in the new Gates Hillman Center. I will then discuss the opportunities and tradeoffs raised by the symbiotic human-robot interaction, and present illustrative studies. I conclude with the presentation of our second CoBot robot and the presentation of our ongoing work towards having multiple robots and humans engaged in planning and coordination for a variety of tasks.Short bio

Manuela M. Veloso is Herbert A. Simon Professor of Computer Science at Carnegie Mellon University. She directs the CORAL research laboratory, for the study of agents that Collaborate, Observe, Reason, Act, and Learn, www.cs.cmu.edu/~coral. Professor Veloso is a Fellow of the Association for the Advancement of Artificial Intelligence, and the President of the RoboCup Federation. She recently 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 200 journal articles and conference papers.