



Fall 2009 CIS Colloquium Series

SUBTLE: Situation Understanding Bot Through Language and Environment

Mitch Marcus
(University of Pennsylvania)

*11am-12pm, Wednesday, November 11
4th Floor Conference Room (Wachman Hall, CC 447)*

Abstract: This talk will present an overview of the SUBTLE project, which brings together researchers from Penn, UMass Amherst, UMass Lowell and Stanford with expertise in a wide range of disciplines: computational linguistics, linguistics, machine learning, robotics, and human-robot interaction. SUBTLE focuses on new methods required for computationally tractable systems that will allow situated robots to understand a habitable subset of English. To do this, a robot must analyze the syntax and literal meaning of utterances, extract the implicit meaning of these utterances and then generate of control programs for a robot platform, for our tests an iRobot ATRV-JR at UMass Lowell. In parallel, we are also developing a virtual simulation of a simple search-and-rescue environment to enable inexpensive large-scale corpus collection to proceed during many stages of system development. Highlights of our project to date are the use of Markov Logics for pragmatic interpretation, the development of methods to go from Linear Temporal Logic specifications of robot tasks to robot controllers, and the use of Procedural Action Representations (PARs) for representing robot actions. We are betting heavily on the development of new methods for computing with probabilistic logics imbedded in Andrew McCallum's new Factorie toolkit. This work is joint work with Norm Badler, Aravind Joshi, and George Pappas at Penn, Andrew McCallum at UMass Amherst, Holly Yanco at UMass Lowell, and Chris Potts at Stanford. SUBTLE is funded by the Army Research Office as a MURI grant.

Bio: Mitch Marcus is the RCA Professor of Artificial Intelligence in the Department of Computer and Information Science at the University of Pennsylvania, where he is also Professor of Linguistics. Mitch works at the intersection of linguistics and computer science, leveraging understanding of the structure of language to develop technologies to automatically extract increasingly rich information from text in various natural languages. His current research is focused on human-robot interaction for future autonomous systems, and on new models for cognitively plausible models for automatic acquisition of linguistic structure that exploit both the linguistic and statistical structure of language. He was the principal investigator for the Penn Treebank Project through the mid-1990s; he and his collaborators continue to develop hand-annotated corpora for use world-wide as training materials for statistical natural language systems. Mitch has served as Chair of the CIS Department, as Chair of the Penn Faculty Senate, as well as President of the Association for Computational Linguistics. He received his Ph.D. from the MIT Artificial Intelligence Lab, and was a Member of Technical Staff at AT&T Bell Laboratories before coming to Penn. He is a Fellow of the American Association of Artificial Intelligence.

Refreshments will be served!