MAE Praxair Special Seminar

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"Human-Robotic Interaction for Multiple Robot Teams"

Abstract:

Human-robotic interaction (HRI) has existed since the first robots, however the HRI area did not receive significant attention until the last few years. Its importance has increased as NASA plans to deploy robots to the Moon and Mars, the military deploys unmanned aerial vehicles, and the military continues to develop unmanned ground vehicles.

This talk discusses issues involved with developing interaction capabilities between humans and large multiple robot teams. A single or small number of humans' ability to supervise a large number of robots (10+) is an issue that has received little research attention. Historically, robotic technology has been developed prior to the HRI. As well, the HRI has typically been designed based upon the developer's feedback only. Finally, most of the research has developed single human teleoperation of one to five robots.

This talk discusses HRI development based upon obtaining actual user feedback. We are employing Goal-Directed Task Analysis and extended Cognitive Work Analysis methodology (as defined by Cummings and Guerlain) to design and develop a system for Chemical, Biological, Radiological, Nuclear, and Explosive device search and rescue.

This talk will also discuss work related to developing autonomous capabilities to support the humans' supervisory role in large robotic systems. In particular, we have been developing a coalition formation algorithm that autonomously determines which robots should be assigned to a particular task.

In short, our work focuses on employing user feedback throughout the development process while also developing autonomous capabilities to support the humans' role. The result should be placing the human in a position of supervising large teams of robots.

206 Furnas Hall
Tuesday, May 17, 2005
Refreshments – 3:00 pm
Seminar 3:30 pm – 4:30 pm