



Wireless Engineering Research and Education Center

Optimized Communication Protocols for Mobile Robots

Nida Fatima Bano

Graduate Student, Department of Electrical and Computer Engineering
Auburn University, Auburn, AL

Abstract

Cooperative Robotics is the use of multiple robotic nodes assisting each other to perform a task that is either too difficult or impossible for one robot to perform alone. It is a multi-disciplinary field that spans the areas of computer science, electrical engineering, and artificial intelligence. Research scenarios often include tasks that are difficult, monotonous, or dangerous for humans to perform. Collaborating mobile robots equipped with WiFi transceivers are configured as a mobile ad-hoc network.

This seminar presents communication schemes between these nodes. The algorithm employed is the search-and-rescue algorithm, referred to as SARA, that is designed to enable a team of cooperative autonomous robots to search an area for a stationary target. This is done in two ways: 1) The robots use wireless communication to build and share collective maps of the environment. 2) The robots make use of mobility models to search the area in an efficient and organized manner. They attempt to spread out their cooperative search, taking care not to explore the same area twice. This algorithm is pertinent to both indoor and outdoor applications. The range of applications is limited only by the user's imagination and might include such tasks as hazardous waste location and removal, planetary exploration, warehouse organization, and human search-and-rescue.

Bio

Nida Fatima Bano is a Masters student in the Department of Electrical and Computer Engineering at Auburn University, Auburn, AL. She obtained her Bachelor's degree in Electronics and Communication Engineering from Muffakham Jah College of Engineering and Technology, Osmania University in 2007. Currently, she is a Research Assistant under Dr. Thaddues Roppel. Her current area of research is Wireless Communications in Collaborative Robotics.

FRIDAY, OCTOBER 23, 2009, 3:00 P.M.
235 BROUN HALL