



Distinguished Seminar Computer Science



Network and Communications Issues for Network-Centric Robotics

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CS 209

Abstract - A growing number of applications in a variety of areas call for network-centric robots to collaborate and coordinate their actions. For example, in applications of real-time exploration and surveillance, multiple robots may require multiple streams of media from a newly explored area be transmitted to the base station in a timely fashion as robots explore the area. While there has been substantial progress for multi-robot exploration of an unknown area, less attention has been paid to communication, especially the bandwidth constraint in time-sensitive and bandwidth-consuming tasks such as search and surveillance. In this talk we consider a number of issues to support n network-centric robotics while considering network bandwidth constraints, heterogeneous transmissions ranges, link capacities, interference, and limitations on the number of exploring robots or network relays. Furthermore, we consider the problem when multiple classes of mobile robots are considered, such as a new class of jumping robots that provide a new dimension to the network bandwidth problem in rugged terrains.

Brief Bio - Matt Mutka is on the faculty of the Department of Computer Science and Engineering, Michigan State University, East Lansing, Michigan, USA, where he is currently professor and department chairperson. He received the B.S. degree in electrical engineering from the University of Missouri-Rolla, the M.S. degree in electrical engineering from Stanford University, and the Ph.D. degree in Computer Science from the University of Wisconsin-Madison. He has been a visiting scholar at the University of Helsinki, Helsinki Finland and a member of technical staff at Bell Laboratories in Denver, Colorado. He is a Fellow of the IEEE and was honored with the Michigan State University Distinguished Faculty Award. His current research interest include mobile computing, wireless networking, and multimedia networking.