ECE Department Seminar
Communications and Networking Lab (CNL)

Date: Sept 26, 2008
Time: 2:00-3:00 pm
Location: JC 3rd Floor Meeting Rm F

Mission-Critical Networking and Situation-Awareness

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Abstract - This presentation covers NIST activities in three key technologies for mission-critical operations: wireless communications and networking, wireless sensor networks, and indoor localization and tracking. In particular, we present a multihop, relay communication system developed at NIST for emergency response and other mission-critical operations in challenging radio communication environments. In an indoor emergency response operation the system relies on intelligent relay nodes brought to the scene by the first responders and deployed by them to ensure reliable communications between the responders and the Incident Command set up outside the building. The system automatically prompts the first responder to deploy a relay node when he/she is about to lose radio connectivity with the Incident Command. The NIST system supports full-duplex voice communications, text messaging, monitoring vital health signs of first responders, and tracking their locations.

We also present an overview of the extensive work done at NIST in the area of indoor localization and tracking. Our work includes performance evaluation of various localization techniques through simulations or prototyping and testing in various building environments, development of a number of novel localization systems, and active participation in standardization activities.

Bio - Nader Moayeri is with the Advanced Network Technologies Division at the National Institute of Standards and Technology (NIST), Gaithersburg, MD. He is involved in basic and applied research and test and evaluation activities to facilitate development of modern standards for wireless communications. Since early 2002 he has spent most of his time on mission-critical communications and networking for various applications, such as public safety and emergency response, coal mine communications, search and rescue operations, and a number of military operations. He has been interested in wireless ad hoc and mesh networks, indoor localization, and wireless sensor networks. He established the Wireless Communication Technologies Group at NIST in 1997 and managed it until 2008. Prior to joining NIST in 1997, Dr. Moayeri worked in the Imaging Technology Department at Hewlett-Packard Laboratories, Palo Alto, CA. From 1986 to 1994, he was on the faculty of the Department of Electrical and Computer Engineering at Rutgers, The State University of New Jersey. He received a Ph.D. in Electrical Engineering - Systems from the University of Michigan in 1986.