

Coordinated Quality of Service in Wireless Sensor Networks

Speaker: Dr. Wendong Xiao, Senior Research Fellow
Institute of Infocom Research (I2R), Singapore

Date: Friday, Feb 23, 2007

Time: 10 am - 12:00 noon

Venue: WH 413 (CReWMaN Lab)

Abstract:

Traditionally, quality of service (QoS) in wireless multimedia networks is measured in terms of end-to-end delay, packet loss ratio, throughput and jitter. However, wireless sensor networks (WSNs) as applied to security and surveillance, healthcare and body sensors, and ambient environment monitoring and control are often non-end-to-end and mission-critical. Such applications demand new QoS requirements such as accuracy of target/location tracking, behavior recognition and prediction, and abnormality detection and prevention, if possible. These requirements offer significant challenges for WSNs having severe resource limitations.

In this talk, I will first give an overview of three projects related to WSNs at the Institute for Infocomm Research (I2R), Singapore. Then I will describe a Coordinated Quality of Service (CQoS) architectural framework. In this cross-layer architecture, the application information quality (IQ) and fusion will be integrated with the traditional network QoS, and implemented as a middleware. Preliminary results will be presented for bandwidth optimization in sensor fusion using IQ, packet transmission delay using Kalman filter estimation theory, and data link layer packet scheduling with the help of routing delay prediction. I'll conclude with open issues and challenges.

Biography:

Dr. Wendong Xiao received his B.S. and Ph.D. degrees from Northeastern University, China in 1990 and 1995, respectively. Currently he is a Senior Research Fellow with the Institute for Infocomm Research (I2R), Singapore. Prior to joining I2R, he was a Research Fellow in Nanyang Technological University (February 2001-July 2004), an Associate Professor in Northeastern University (May 1999-February 2001) in China, and a Post-Doctorate Fellow in the POSCO Technical Research Laboratories, South Korea (April 1996-April 1999). His main research interests include various aspects of wireless ad hoc and sensor networks, wireless QoS collaborative signal processing, communication protocols and cross-layer integration. Currently he serves as a PI / co-PI of several WSN related projects.