Responsiveness and Connectivity of Wireless Sensor Networks for Bridge-Monitoring Applications

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Abstract:
In this talk, I will introduce the responsiveness and connectivity issues of wireless sensor networks (WSN) in the context of bridge monitoring applications. Our solutions from the data link layer will be presented. Specifically (i) the history of network design addressing wireless collisions will be briefly discussed and our approach of using pulses for collision detection to improving the WSN responsiveness will be explained in detail; and (ii) the history of the critical communication radius problem will be briefly discussed and our result of determinate upper and lower bounds of the critical radius for the connectivity of bridge-monitoring WSN will be explained in detail.

Bio:
Liang Cheng is an associate professor of computer science and engineering with tenure at Lehigh University. He has directed LONGLAB (Laboratory Of Networking Group) since 2002 and graduated three Ph.D. students, served on sixteen Ph.D. dissertation committees, and supervised one postdoc and several visiting student/scholars. Dr. Cheng has been the Principal Investigator (PI) and a Co-PI of fourteen projects supported by the U.S. National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), the U.S. Department of Energy (DOE), Pennsylvania Department of Community and Economic Development, Agere Systems, Inc. and East Penn Manufacturing Co., Inc. He has authored/co-authored papers in areas of distributed real-time and embedded systems, sensor networks, system management and security, and network design including IPv6 networks.