**Holcombe Department of Electrical and Computer Engineering Seminar Series**

**Large Scale Wireless Networking Systems: Theory, Experiences, and Lessons**

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**Abstract**

Wireless sensor networks have been extensively studied from many aspects in the last decade. In this talk, I will talk about our recent theoretical results on the asymptotical behavior of large scale ad hoc and sensor networks, our experiences and lessons in building real operational large scale wireless sensor networking systems. In the first part of the presentation, I will summarize our results on the asymptotical network capacity of large scale wireless sensor networks, such the asymptotical multicast capacity under various interference models. In the second part of the presentation, I will discuss the challenges and the lessons we learned from large scale real sensor system deployments. In the past 5 years, collaborated with several researchers, we deployed prototype sensor networks in the Yellow Sea (OceanSense system, 2007-2009), in Tian-Mu Mountain (GreenOrbs system, 2009-2011), and in WuXi City (CitySee system, 2011-present). For the CitySee system, more than 1200 sensor nodes have been deployed in a city environment, which covers a 1.12 square kilometers area. Currently, we are working towards a 4000 sensor system for urban sensing in WuXi City, China. These large scale systems provide us a unique opportunity to observe and understand the behavior of large scale sensor networking systems.

**Biography of Speaker**

Dr. Xiang-Yang Li has been an Associate Professor (since 2006) and Assistant Professor (from 2000 to 2006) of Computer Science at the Illinois Institute of Technology. He is recipient of China NSF Outstanding Overseas Young Researcher (B). Dr. Li received MS (2000) and PhD (2001) degree at Department of Computer Science from University of Illinois at Urbana-Champaign. He received a Bachelor degree at Department of Computer Science and Technology, and a Bachelor degree at Department of Business Management from Tsinghua University, P.R. China, both in 1995. His research interests include the cyber physical systems, wireless sensor networks, game theory, and algorithms. The research of Dr. Li has been supported by USA NSF, HongKong RGC, and China NSF. He published a monograph "Wireless Ad Hoc and Sensor Networks: Theory and Applications". He also co-edited the book "Encyclopedia of Algorithms". Dr. Li is an editor of several journals, including IEEE Transaction on Parallel and Distributed Systems, IEEE Transaction on Mobile Computing. He served at various capacities (conference chair, TPC chair, or local arrangement chair) in a number of international conferences. He has graduated nine PhD students since 2004. For more information about Prof. Xiang-Yang Li, please check his webpage [www.cs.iit.edu/~xli](http://www.cs.iit.edu/~xli).