



Fall 2010 Colloquium

Temple University Computer and Information Sciences

Compressive Sensing in Wireless Sensor Networks

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Abstract:

Traditionally, massive amounts of data are first collected and then discarded in large part at the compression stage to facilitate storage and transmission. This process of massive data acquisition followed by compression turns out to be extremely wasteful. Compressive sensing (CS), on the other hand, acquires just the important information about the data via non-adaptive random projections and then reconstructs the compressible signal via sparse signal recovery techniques. In this talk, we will report our recent research on sensor network data gathering and target counting based on CS. We will elaborate how to formulate and solve the problems and report our simulation results to demonstrate the superiority of our CS based approach compared to other techniques. Since most existing sparse recovery algorithms do not target the unique properties of sensor networks, we propose two greedy matching pursuit algorithms to provide high-performance compressive data gathering and sparse target counting.

Bio:

Xiuzhen Cheng received her MS and PhD degrees in computer science from the University of Minnesota -- Twin Cities, in 2000 and 2002, respectively. She is an associate professor at the Department of Computer Science, The George Washington University, Washington DC. Her current research interests include cyber-physical systems, wireless and mobile computing, sensor networking, wireless and mobile security, and algorithm design and analysis. She has served on the editorial boards of several technical journals and the technical program committees of various professional conferences/workshops. She also has chaired several international conferences. She worked as a program director for the US National Science Foundation (NSF) from April to October in 2006, and from April 2008 to May 2010. She received the NSF CAREER Award in 2004.