



Presents the Summer 2013 EECS Seminar Series

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“A Compressive Sensing Approach to Distributed Data Storage in Wireless Sensor Networks”
Monday, June 24, 2013 • 2:00 p.m. • HEC 450

The reliable operation of the emerging large-scale networking paradigms such as wireless sensor networks (WSNs) is susceptible to their overwhelming communication, computation, and sensing complexities. Consequently, new communication and sensing schemes that ensure reliability are in serious demand to enable the widespread applications of such networks. Our group is one of the pioneers in integrating compressive sensing (CS) into underlying networking protocols in wireless sensor networks for cross-layer optimization. Compressive sensing is an elegant technique that enables under sampling of signals with a sparse representation in a proper basis. Our results prove the efficiency of our proposed method in reducing the communication cost and enhancing the reliability and life time of WSNs.

In this talk, I will mainly present our compressive-sensing-based scheme for efficient and distributed data storage in large-scale wireless sensor networks. Our scheme, referred to as CStorage, exploits the spatial correlation of sensor readings and integrates CS with a low-complexity and scalable routing algorithm. I will further summarize some of our research efforts in designing efficient CS schemes for extended signal models. Such designs significantly enhance CS performance and can facilitate its application in a variety of fields. The presentation concludes with a discussion of future challenges and open areas for further study.

BIOGRAPHY

Nazanin Rahnavard is an Assistant Professor in the School of Electrical and Computer Engineering at Oklahoma State University, where she joined in August 2007. She received her B.S. and M.S. degrees in electrical engineering from the Sharif University of Technology, Tehran, Iran, in 1999 and 2001, respectively. She then joined the Georgia Institute of Technology, Atlanta, GA, in 2002, where she received her Ph.D. degree in the School of Electrical and Computer Engineering in 2007.

Dr. Rahnavard is the recipient of an NSF CAREER Award in 2011 and the Outstanding Research Award from the Center of Signal and Image Processing at Georgia Tech in 2007. She has interest and expertise in a variety of research topics ranging from the communications and signal processing to networking. She is particularly interested in modern coding and its applications, compressive sensing and its applications, wireless sensor networks, and cognitive radio networks. She serves on the editorial boards of the Elsevier Journal on Computer Networks (COMNET) and on the Technical Program Committee of several conferences such as IEEE ISIT, IEEE Globecom, IEEE VTC, IEEE ICC and Military Communications.