



# Illinois Center for Wireless Systems

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## ICWS Seminar Series



### **HOW TO HELP (AND BE HELPED) IN DISTRIBUTED DATA COMPRESSION**

Professor Aaron Wagner  
Electrical & Computer Eng.  
Cornell University

Friday, September 16, 2011  
141 Coordinated Science Lab/4:00 p.m.

**Abstract:** The fundamental limit of lossy data compression is well known if there is one compressor, one decompressor, and one source to be compressed. We consider a slight extension that is one of the most basic unsolved problems in network information theory: what should a second compressor, with access to a corrupted version of the source, do to be most helpful? We consider the case in which both the main source and the helper's version are Gaussian vectors and determine the optimal coding scheme, settling an open problem raised by Liu and Viswanath in 2007. The proof is related to that of the converse for the Gaussian MIMO broadcast channel, but it also requires several new ideas. The optimal compression scheme turns out to be relatively simple, and we further show that this scheme is not optimal in general.

This is joint work with Md. Saifur Rahman, Benjamin G. Kelly, and Yucel Altug.

The talk will open with trailers of several projects including classification of high-dimensional data, secrecy in point-process and timing channels, and coding for peer-to-peer systems.

**Biography:** Aaron Wagner is an Assistant Professor in the School of Electrical and Computer Engineering at Cornell University. He received the B.S. degree from the University of Michigan, Ann Arbor, and the M.S. and Ph.D. degrees from the University of California, Berkeley. During the 2005-2006 academic year, he was a Postdoctoral Research Associate in the Coordinated Science Laboratory at the University of Illinois at Urbana-Champaign and a Visiting Assistant Professor in the School of Electrical and Computer Engineering at Cornell. He has received the NSF CAREER award, the David J. Sakrison Memorial Prize from the U.C. Berkeley EECS Dept., the Bernard Friedman Memorial Prize in Applied Mathematics from the U.C. Berkeley Dept. of Mathematics, and the Cornell Michael Tien '72 College of Engineering Teaching Award.