



# Illinois Center for Wireless Systems

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## ICWS Seminar Series



### Taming the Wireless Power Hog in Mobile Systems

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**Abstract:** Advancement in wireless and semiconductor technologies has equipped modern mobile devices with wireless broadband access. Yet wireless broadband interfaces are among the largest power consumers on mobile devices, which are constrained in both battery lifetime and heat dissipation capability. While extensive research has addressed this with network solutions, we have recently investigated complementary, system solutions. In this talk, we will begin with an analysis of the fundamental ways modern wireless broadband access wastes energy. We then present our recent research results in addressing three of such wastes. First, we demonstrate that 802.11 interfaces can enter power-saving modes even during active data communication to reduce temporal waste. Second, we present a multi-antenna system that reduces directional waste with directional antennas. Finally, we show that context information can be employed to judiciously combine multiple wireless interfaces with complementary power characteristics to reduce protocol waste. We intend these techniques to be implemented in wireless network interfaces and to require no change or cooperation from the network infrastructure.

**Bio:** Lin Zhong received his B.S. and M.S. from Tsinghua University in 1998 and 2000, respectively. He received his Ph.D. from Princeton University in September, 2005. He was with NEC Labs, America, for the summer of 2003 and with Microsoft Research for the summers of 2004 and 2005. He joined the Department of Electrical & Computer Engineering, Rice University as an assistant professor in September, 2005. He received the AT&T Asian-Pacific Leadership Award in 2001 and the Harold W. Dodds Princeton University Honorific Fellowship for 2004-2005. He coauthored one of the 30 most influential papers in the first 10 years of Design, Automation & Test in Europe Conferences (DATE). He and his students received best paper awards from ACM MobileHCI'07 and IEEE PerCom'09. His research interests include mobile & embedded system design, human-computer interaction, and nanoelectronics. His research has been funded by National Science Foundation, Motorola Labs, Texas Instruments, Nokia, and Microsoft Research