

ECE DISTINGUISHED SPEAKER SERIES



Edward W. Knightly

Rice University

Host: Professor Tommaso Melodia

**Diverse Spectrum Wi-Fi:
Research Advances and
Global Trials**

Wednesday, January 27

The Fenway, Room 378

12:00-1:00 pm

Reception to follow

*Sponsored by the
Department of Electrical and
Computer Engineering*

Worldwide, spectrum regulators are repurposing spectrum and introducing new frameworks for spectrum sharing. In this talk, I will describe new standards, prototypes, and research advances exploiting new spectrum bands. I will focus on the unique characteristics of bands below 1 GHz, often termed the "beach front property" of spectrum due to their superior range and penetration capabilities compared to existing WiFi bands. I will describe capabilities and limitations of recent techniques for realizing high spectral efficiency including medium access exploiting multi-user MIMO. I will draw on experiences from ongoing research trials and measurement studies in Houston, Texas and Itaipu, Brazil.

Edward W. Knightly is a professor and the department chair of Electrical and Computer Engineering at Rice University in Houston, Texas. He received his Ph.D. and M.S. from the University of California at Berkeley and his B.S. from Auburn University. He is an IEEE Fellow, a Sloan Fellow, and a recipient of the National Science Foundation CAREER Award. He received best paper awards from ACM MobiCom, IEEE SECON, and the IEEE Workshop on Cognitive Radio Architectures for Broadband. He has chaired ACM MobiHoc, ACM MobiSys, IEEE INFOCOM, and IEEE SECON. He serves as an editor-at-large for IEEE/ACM Transactions on Networking and serves on the IMDEA Networks Scientific Council.

Professor Knightly's research interests are in the areas of mobile and wireless networks with a focus on protocol design, performance evaluation, and at-scale field trials. He leads the Rice Networks Group. The group's current projects include deployment, operation, and management of a large-scale urban wireless network in a Houston under-resourced community. This network, Technology For All (TFA) Wireless, is serving over 4,000 users in several square kilometers and employs custom-built programmable and observable access points. The network is the first to provide residential access in frequencies spanning from unused UHF TV bands to legacy WiFi bands (500 MHz to 5 GHz). His group developed the first multi-user beam-forming WLAN system that demonstrates a key performance feature provided by IEEE 802.11ac. His group also co-developed a clean-slate-design hardware platform for high-performance wireless networks, TAPs and WARP.



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