

# Telecommunications Seminar Series presents:

## "A Harmful Interference Model for Secondary Spectrum Access"



**Friday, November 20 | 1 pm**

Meet & Greet at 12:30 pm

IS Building, Room 403

**Timothy X. Brown**

Department of Electrical & Computer Engineering,  
Carnegie Mellon University

**ABSTRACT:** Recent FCC proceedings have considered the notion of unlicensed device operation in licensed bands. Licensed users are concerned about harmful interference while unlicensed device manufacturers and operators are concerned that harmful interference is an imprecise design concept. This paper addresses two elements to these concerns.

First, it develops an explicit model of harmful interference to be included in unlicensed device rules. Such a model provides explicit bounded protection to the licensed user while providing assurances and performance goals to the unlicensed device manufacturers. Second, it presents an analytic model for assessing harmful interference that not only provides quantitative analysis, but, also provides insight into how factors such as directional antennas, power control, and licensed channel avoidance strategies affect the aggregate interference. Further, it suggests that complex factors such as unlicensed device modulation schemes can be captured in a simple measurement.

**BIO:** Timothy X. Brown received his BS in physics from Pennsylvania State University and his PhD in electrical engineering from California Institute of Technology. He has worked at both the Jet Propulsion Laboratory and Bell Communications Research. Since 1995, he has been at the University of Colorado at Boulder, most recently as Professor in Electrical, Computer, and Energy Engineering and Director of the Interdisciplinary Telecommunications Program. He is currently a Distinguished Service Professor at Carnegie Mellon University in EPP, ECE, and the graduate programs in Kigali, Rwanda. His research interests include wireless communication systems, network security, and machine learning. His recent research funding includes NSF, DOE, and industry. Projects include the role of mobility in network control of unmanned aircraft, denial of service vulnerabilities in wireless protocols, spectrum policy frameworks for cognitive radios, and stochastic geometry applied to wireless networks. He is a recipient of the NSF CAREER Award, and the GWEC Wireless Educator of the Year Award.