**The Price of Free Spectrum**

Abstract:

Based on current trends of wireless data usage, there will be a significant shortage of spectrum for wireless data services in the next 10 years. One proposed solution to this is to increase the amount of "open" or unlicensed spectrum enabling any firm to offer wireless services without purchasing a license. For example, the FCC in the U.S. has recently done this by permitting unlicensed access to the so-called television white spaces. While this additional unlicensed spectrum allows for market expansion, it also influences competition among providers and can increase congestion (interference) among consumers of wireless services. In this talk we present a model for price competition among firms that have access to such a band of open spectrum and may also have access to separate licensed bands. Each band is viewed as a congestible resource, with congestion in the open band depending on the actions of all firms. We study the impact of adding additional spectrum on the total welfare of wireless users and service providers. Extension to the model to include heterogeneous user preferences and entrance decisions will also be discussed. This is based on joint work with Michael Honig, Thanh Nguyen, Rakesh Vohra and Hang Zhou.

Bio:

Randall Berry received the B.S. degree in Electrical Engineering from the University of Missouri-Rolla in 1993 and the M.S. and PhD degrees in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology in 1996 and 2000, respectively. In 2000, he joined Northwestern University, where he is currently a Professor in the Department of Electrical Engineering and Computer Science. In 1998 he was on the technical staff at MIT Lincoln Laboratory in the Advanced Networks Group. His primary research interests include wireless communication, network economics, and information theory. Dr. Berry is the recipient of a 2003 NSF CAREER award.  He has served on the editorial boards of the IEEE Transactions on Wireless Communications (2006 to 2009) and the IEEE Transactions on Information Theory from (2009 to 2011). He was a co-chair of the 2012 IEEE Communication Theory Workshop and a technical co-chair of 2010 IEEE ICC Wireless Networking Symposium and the 2008 IEEE Communication Theory Workshop. He has also been a guest editor for special issues of the IEEE Journal on Selected Topics in Signal Processing and the IEEE Transactions on Information Theory.