香港城市大學 City University of Hong Kong

Department of Electronic Engineering

毫米波國家重點實驗室 State Key Laboratory of Millimeter Waves

IEEE (HK) Section AP/MTT

Seminar on

Wireless Communication Security: Physical-Layer Techniques Exploiting Radio and Propagation Characteristics

by

Prof. Michael A. Jensen
Brigham Young University, Provo, UT 84602, USA

Abstract

Because of the inherent vulnerabilities associated with wireless data transmission, significant recent attention has focused on increasing communication security. While most commonly, this security is accomplished at the higher layers of the protocol stack, recent research has demonstrated that certain features of the radio antennas and hardware as well as the properties of the electromagnetic propagation can be exploited to enhance transmission security. For example, imperfections in the hardware of real transmitters create unique distortions in the transmitted signal, forming a "fingerprint" that can uniquely identify a node and allow enhanced reliability during authentication. Similarly, the key used for encryption and decryption of a secure message can be established by exploiting the reciprocal nature of the electromagnetic propagation between two radios, an approach that overcomes some of the challenges associated with traditional key establishment methods. This talk focuses on these physical security approaches, with particular emphasis on how the use of multiple antennas can enhance the effectiveness of the techniques. The performance of many of the techniques is demonstrated using measurements from real multi-antenna radios and channel sounding equipment.

Biography

Michael Jensen received the B.S. and M.S. degrees in Electrical Engineering from Brigham Young University (BYU) in 1990 and 1991, respectively, and the Ph.D. in Electrical Engineering from the University of California, Los Angeles in 1994. Since 1994, he has been at the Electrical and Computer Engineering Department at BYU where he is currently Professor. He has published over 230 articles and book chapters on the topics of antennas, propagation, and signal processing for wireless communication, with emphasis on multi-antenna communication systems. He has been recipient of the Best Student Paper Award at the IEEE Antennas and Propagation Society Symposium in 1993, the H. A. Wheeler Applications Prize Paper Award in the *IEEE Transactions on Antennas and Propagation* in 2002, and several outstanding faculty awards at Brigham Young University. He was elevated to the grade of IEEE Fellow in 2008.

He has served as Chair of his department, as the Technical Program Chair or General Co-Chair for 8 different symposia, as a member and chair of the IEEE Antennas and Propagation Society Joint Meetings Committee, and as an elected member of the IEEE Antennas and Propagation Society AdCom. He has been an associate editor of the *IEEE Transactions on Antennas and Propagation* and the *IEEE Antennas and Wireless Propagation Letters*, and he currently serves as the Editor-in-Chief of the *IEEE Transactions on Antennas and Propagation*.

Date : 21 Jan., 2013 (Monday)
Time : 11:00am – 12:00noon
Venue : G6302, 6/F, Green Zone, Academic 1, City University of Hong Kong

***** ALL ARE WELCOME *****

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