

Seminar on

Radio Propagation Measurement and Modeling in Wireless Communication Environments

by

Dr. Soo Yong Lim

Department of Electrical and Electronic Engineering, University of Nottingham, Malaysia

Abstract

A key step in the optimal design of wireless communication systems is a good understanding of radio waves propagation through wireless channels. As wireless communications become more ubiquitous, new and complex propagation environments emerge which demand careful investigation of the propagation mechanisms therein. This talk focuses on the studies of several complex environments, namely, indoor stairwells, periodic building facades, and open-trench drains. Firstly, for indoor stairwells, extensive field measurements, numerical simulations and theoretical analysis were employed to examine the propagation mechanisms such as depolarization in these environments. The research findings advance a better understanding of radio wave propagation in indoor stairwells and provide practical propagation models for the design of wireless communication systems in such environments. Secondly, for periodic building facades, in addition to understanding various propagation mechanisms, an important issue in propagation modeling using ray tracing method is addressed. Since the structures of building facades are complicated, it is common for researchers to replace them with simpler structures such as flat slabs that fit the ray tracing method. This study investigates the feasibility of such simplification and finds out how much accuracy will thus be compromised. The research findings give researchers and users of ray tracing algorithm/software a clue as to what degree to simplify their building façade models or similar structures. Thirdly, for open-trench drains, the behaviors of radio signal inside such structures were studied via the empirical and numerical approaches. The proposed research topic concerns a unique situation in several Asian countries, because the drainage systems in these countries differ notably from those in the US and Europe, in that the former are partially open on the top while the latter are primarily below ground and covered. Understanding the complicated wave propagation behavior inside the open-trench drains and their surroundings provide a useful indicator in designing reliable wireless communication systems, especially in environments where such structures exist.

Biography

Soo Yong Lim (Grace) (M'07–SM'13) received the BEng(Hons) degree in electronics majoring in telecommunications from Multimedia University, Malaysia, in 2003 and the Ph.D. degree in electrical engineering from the University of Hawaii at Manoa, USA, in 2010. From 2004 to 2006, she was a Research Officer with the Centre for Applied Electromagnetic, Multimedia University, Malaysia; from 2007 to 2010 she was a Graduate Assistant at the University of Hawaii at Manoa; and from 2011 to 2013, she was a faculty member with the Department of Computer Science and Networked System, Sunway University, Malaysia. She is now an Assistant Professor with the Department of Electrical and Electronic Engineering, Faculty of Engineering, University of Nottingham Malaysia Campus. Since January 2013, she has also been appointed as an adjunct faculty with the Hawaii Center for Advanced Communications (HCAC), College of Engineering, University of Hawaii at Manoa. Her current research interest includes radio propagation modeling, channel measurements, and ray tracing. Dr. Lim was a recipient of the Award for Achievement in Research for Early Career Researchers, Sunway University, in 2012. Also in 2012, she received a Bronze Medal for her research achievement at the Malaysia Technology Expo, awarded by the Malaysian Association of Research Scientists. She is a registered engineer both with the Boards of Engineers Malaysia (BEM) and with the Institution of Engineers Malaysia (IEM).

Date : 24 June, 2014 (Tuesday)
Time : 10:30 am – 11:30 am
Venue : Room 15-202, meeting room of State Key Laboratory of Millimeter Waves, 15/F, Academic 3, City University of Hong Kong

*** ALL ARE WELCOME ***

Enquiries:

Prof Kwok Wa Leung, Department of Electronic Engineering
Tel.: 852-3442 9659 Fax: 852-3442 0562 e-mail: eekleung@cityu.edu.hk