

The Department of Electrical and Computer Engineering presents:

A DISTINGUISHED SEMINAR

PROFESSOR SUMIT ROY



## SPECTRUM SHARING: SCENARIOS AND OPPORTUNITIES

### ABSTRACT

This talk presents an overview of current Spectrum Sharing research resulting from the Jun 2010 U.S. Presidential Memorandum (<https://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution>) to "make available a total of 500 MHz of Federal and nonfederal spectrum over the next 10 years, suitable for both mobile and fixed wireless broadband use". The first two instances are the 1.7 GHz AWS-3 band transition of 50 MHz (<https://www.ntia.doc.gov/category/aws-3-transition>) and 3.5 GHz CBRS band of 150 MHz, that will require coordination between numerous Federal incumbents (various terrestrial point-to-point and airborne telemetry networks and radar systems etc.) and cellular operator networks (notably, 4G LTE and WiFi).

The talk will touch on several components pertinent to design and evaluation of new spectrum sharing systems:

- Link Layer Enablers for Spectral Co-existence: Radar/Wi-Fi & LTE  
Effective co-existence between co-located Federal and civilian communication systems must necessarily balance two conflicting goals: ensuring that the cumulative impact of interference from cellular LTE/WiFi networks fall within incumbent protection guidelines, while simultaneously quantifying the impact of Federal system operations on such secondary network throughput. Some recent results on link layer co-existence mechanisms between a search radar and Wi-Fi networks will be described as an illustration.
- Spectrum Mapping using Wide Area RF Software Defined Radio/Sensors  
Support for Dynamic Spectrum Access (DSA) whereby secondary (unlicensed) users reuse bands on a 'non-interfering' basis with the primary (licensed) users requires real-time monitoring supported by suitable database architectures. A currently operational wide-area distributed spectrum monitoring infrastructure using fixed rooftop spectrum sensors enabling persistent data (mix of I-Q and time-average power spectrum) collection that is cloud archived, for public availability, will be described.

### BIOGRAPHY

Sumit Roy received the B. Tech. degree from the Indian Institute of Technology (Kanpur) in 1983, and the M. S. and Ph. D. degrees from the University of California (Santa Barbara), all in Electrical Engineering in 1985 and 1988 respectively, as well as an M. A. in Statistics and Applied Probability in 1988. Presently he is Integrated Systems Professor of Electrical Engineering, Univ. of Washington where his research interests include fundamental analysis/design of wireless communication and sensor network systems spanning a diversity of technologies and system application areas: next-gen wireless LANs and beyond 4G cellular networks, heterogeneous network coexistence, spectrum sharing, white space networking and software defined radio platforms, vehicular and underwater networks, smart grids and RFID sensor networking.

February 5, 2018



WCH 205/206  
11:10 a.m. - 12:00 p.m.