

## Seminar

Thursday, Dec. 7th, 2:15-4:30 pm, Room 4164 Harold Frank Hall (ECE Conference Room)

# Introduction to Mobile WiMAX Radio Access Technology: PHY and MAC Architecture

Sassan Ahmadi

Intel Corporation

**Abstract:** The Worldwide Interoperability for Microwave Access (WiMAX) is a rapidly growing broadband wireless access technology based on IEEE 802.16-2004 and IEEE 802.16e-2005 air-interface standards that will play a key role in future fixed and mobile broadband wireless services. Mobile WiMAX is a broadband wireless access solution that enables convergence of mobile and fixed broadband networks through a common wide area broadband radio access technology and flexible network architecture. The mobile WiMAX air interface utilizes Orthogonal Frequency Division Multiple Access (OFDMA) as the radio access method for improved multipath performance in non-line-of-sight environments. Scalable OFDMA (SOFDMA) is utilized in the IEEE 802.16e to support scalable channel bandwidths from 1.25 to 20 MHz. This presentation provides an overview of mobile WiMAX physical layer (PHY) and medium access control layer functions and features including adaptive modulation and coding techniques, link adaptation, SU-MIMO schemes (TxBF, closed-loop and open-loop MIMO, and UL collaborative MIMO techniques), signaling and control mechanisms, mobility support (handoff, sleep and idle protocols, paging), etc. VoIP and Multicast and Broadcast Service capabilities will also be reviewed. Performance data based on WiMAX Forum simulations will be provided.

**Biographical Sketch:** Sassan Ahmadi received his BS, MS, and Ph.D. degrees all in Electrical Engineering in 1988, 1990, and 1997, respectively. From 1997 to 2005, he was a principal engineer with Nokia Inc. where he successfully contributed to and led the VMR-WB project. Dr. Ahmadi was also affiliated as a lecturer with University of California, San Diego from 2000-2003. He joined Intel Corporation in June 2005 as a wireless communication system architect. His new focus areas are mobile WiMAX and 4G cellular standards, design and development of physical and medium access control layers of MIMO-OFDM-based systems. He is currently leading the IEEE 802.16m project (the next generation of mobile WiMAX) in Intel Corporation. He can be reached at [sassan.ahmadi@intel.com](mailto:sassan.ahmadi@intel.com).

**Department Host:** Jerry D. Gibson, [gibson@mat.ucsb.edu](mailto:gibson@mat.ucsb.edu)