Graduate Seminar (EEL 6936)
Department of Electrical Engineering
http://ee.eng.usf.edu/Grad_Seminar

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Engineering Building Ⅱ (ENB) Room 118

5G: Opportunities, Challenges, and Technologies
The *Internet of Tomorrow*

Abstract

The upcoming fifth generation (5G) of mobile communication systems will impact our life more than any other wireless technology in the past by enabling a seamlessly connected society in the 2020 timeframe. This presentation will preview the expected disruptive market opportunities, new applications, and the technologies needed to facilitate the holistic integration of cellular, WiFi, the Internet of Things (IoT), and other wireless systems into a heterogeneous *Internet of Tomorrow* with extraordinary capabilities that brings together people, data, and "things", and a myriad of new applications. 5G is expected to create massive new markets in secure autonomous transport systems, smart cities and grids, health care, agriculture, construction, and many more market disruptions. Key technological challenges and research directions will be discussed in the domains of network architecture, air interface, security, and utilization of cloud systems to address the daunting 5G/IoT requirements of latencies of 1ms, significant increases in security and resilience, as well as a massive increase in throughput.

Biography

Dr. Gitlin is a State of Florida 21st Century World Class Scholar, Distinguished University Professor, and the Agere Systems Chaired Distinguished Professor of Electrical Engineering at the University of South Florida. He has a record of significant contributions that have been sustained and prolific over several decades. Dr. Gitlin is an elected member of the US National Academy of Engineering (NAE), a Fellow of the IEEE, a Bell Laboratories Fellow, and a Charter Fellow of the National Academy of Inventors (NAI). He is also a co-recipient of the 2005 Thomas Alva Edison Patent Award and the IEEE S.O. Rice prize (1995), has co-authored a communications text, published more than 100 papers, including 3 prize-winning papers, and holds 55 US patents. After receiving his doctorate at Columbia University, he joined Bell Laboratories, where he worked for 32-years performing and leading pioneering research and development in digital communications, broadband networking, and wireless systems including: coinvention of DSL (Digital Subscriber Line), multicode CDMA (used in 3/4G wireless), and

pioneering the use of smart antennas ("MIMO") for wireless systems. At his retirement, Dr. Gitlin was Senior VP for Communications and Networking Research at Bell Labs, a multi-national research organization with over 500 professionals. After retiring from Lucent, he was visiting professor of Electrical Engineering at Columbia University, and later he was Chief Technology Officer of Hammerhead Systems, a venture funded networking company in Silicon Valley. Since joining USF in 2008, his research has focused on the intersection of communications with bio-medical engineering and created an interdisciplinary team that is focused on wireless networking *in vivo* miniature wirelessly controlled devices to advance minimally invasive surgery and other cyber-physical health care systems, as well as on 5G wireless systems.