UCF DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCEINCE

Fall 2014 Seminar Series

Presented by the ECE Division

Internet-of-Things: Technology Evolution and Challenges

MONDAY OCTOBER 13, 2014 • 10:30 AM - HEC 101

This talk briefly summarizes the technology evolution of Internet-of-Things (IoT) from RFID. The key differences between the internet and the Internet-of-Things are addressed. Five key technologies for IoT have been summarized and the technical trends of IoT are introduced. The further development of IoT will be driven by the existing urgent demands, namely smart-manufacturing, smart-healthcare for elderly, intelligent transportation, smart city, safety monitoring of buildings and bridges as well as industrial factories.

Internet of Things is still a vague term that refers to the network of physical, identifiable, objects connected via the internet, which can sense and communicate. Object tagging using radio-frequency identification is considered to be a precursor for the Internet of Things. Key enabling technologies include wireless identification, sensing, localization, and connectivity. According to Cisco, there will be 25 billion devises connected to the internet by 2015, and 50 billion by 2020, creating $14.4 trillion of value at stake for companies and industries. Companies that already have an IoT division include Intel, Oracle, Cisco, Samsung, Google and Hitachi among many others.

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Jianguo Ma (M'96, SM'97) received his doctoral degree in engineering from Duisburg University, Duisburg, Germany. He was with Technical University of Nova Scotia, Halifax, Canada from April 1996 to September 1997 as a postdoctoral fellow. He joined the Nanyang Technological University in Singapore from October 1997 to November 2005 as a faculty member, where he was the founding director of the Center for Integrated Circuits and Systems. From December 2005 to October 2009 he was with University of Electronic Science and Technology of China, Chengdu, China. He is the Technical Director for Tianjin IC Design Center since November 2008 and serves as the Dean for the School of Electronic Information Engineering at Tianjin University since October 2009. He also serves as the founding director of the Center for IC & Computing Systems of Tianjin since May 2010.

His research interests include RFICs and RF integrated systems for wireless communication, RF device characterization modeling, MMIC, RF/microwave circuits & systems, EMI in wireless, RFID & wireless sensing network, Internet-of-Things. He has published 269 technical papers (125 are in SCI cited journals), granted six U.S. patents and 20 Chinese patents, and authored two books.

Dr. Ma served as the Associate Editor of the IEEE Microwave and Wireless Components Letters from January 2004 to December 2005. He was one of the founding members for IEEE Chengdu Section and served as the External Liaison Chair and Technical Activity Chair for IEEE Chengdu Section.

Dr. Ma is the Changjiang Professor awarded by the Ministry of Education of China. He is also the Distinguished Young Investigator awarded by National Natural Science Foundation of China. He serves as a member for the IEEE University Program Ad Hoc Committee and on the Editorial Board of Proceedings of IEEE.

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