Backscatter Communications: An Elegant Path Towards Passive IoT Connectivity

Date: Tue. 18th Feb.
Time: 1:00 pm
Location: Building 59, Room 2016

Speaker:

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Abstract:

The next-generation, short-range IoT sensors require a low-powered communication mechanism that enables reliable communications at reasonable distances with minimal power consumption. A well-known method, akin to the radar, is backscatter communications—which uses the echo of transmitted signal to extract information about some distributed sensors. Backscatter systems have been used in several applications such as shipment tracking and remote sensing. A recent application is in the aviation industry in which bags are tagged with RFID tags, which allows passengers to keep track of their bags and significantly reduced mishandled baggage. This seminar briefly introduces the history of backscatter communications, explains the mechanisms of backscatter communications, and presents some challenges associated with current backscatter systems along with potential research problems.

Bio:

Dr. Mohammad S. Alhassoun received the B.Sc. degree in electrical engineering from King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia in 2013 and the MS and PhD degrees both from the Georgia Institute of Technology, Atlanta in 2015 and 2019, respectively. His PhD research pertains to retrodirective RFID tags, millimeter-wave RFID technology, and stochastic models of backscatter channels. He is the recipient of both the 2018 and 2019 IEEE International Conference on RFID best paper award. He previously worked at Nokia Bell Labs as an EMCD intern and a graduate assistance at KFUPM where he was awarded the best lab instructor in the Department of Electrical Engineering. He also spent nine weeks as a visiting researcher in the Portable Radio Research Group (MPRG) at Virginia Tech. He was also awarded the Tech to Teaching Certificate in College Teaching from the Georgia Institute of Technology in addition to the Associate Level Certificate from the Center of Integration of Research, Teaching and Learning. In the spring of 2020, he started an assistant professor position at KFUPM, Saudi Arabia. His research interests are in applied electromagnetics, wireless communications, and the physical-layer based applications of machine learning.