

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

Improving Privacy, Accuracy and Bandwidth Efficiency for Radio Frequency Sensing in Smart Health Applications

PhD Preliminary Research Examination

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Abstract:

In recent years, the use of radio frequency (RF) signals for human-centered sensing has demonstrated the capability to address shortcomings in other sensing modalities and created opportunities for new applications. RF based sensing is a key instrument in smart health systems where health monitoring is performed with non-contact sensors, and potential health risks like collisions between sports players are reduced with ranging and collision detection. In order to re-purpose commercial radio transceivers as inexpensive RF sensors for smart health, an RF sensing system needs to address its particular challenges, such as its high spectrum utilization needs and quantization issues that arise because standard transceivers were not designed with RF sensing in mind. On the other side, attackers can use standard radio transceivers to perform RF sensing that invades privacy, for example by monitoring people's activities in their homes. Proper design of wireless transceivers could reduce the feasibility of such attacks. In this talk, I will present estimators and new RF sensing systems, evaluate their performance and spectrum efficiency, and show new analysis tools. These contributions are developed both for the development of smart health sensors as well as to inform the design of devices, which, for privacy reasons, do not reveal health information.

DATE: Thursday, January 31, 2019

TIME: 1:00 p.m.

PLACE: Green Hall, Room 0120

Dissertation advisor:

Dr. Neal Patwari

This seminar is in partial fulfillment
of the Doctor of Philosophy degree