

## Spring 2015 Seminar Series

Presented by the ECE Division

### Smart Radar Sensors for Biomedical and Civil Applications

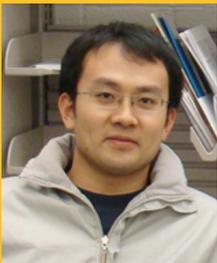
Monday, February 16th, 2015

2:00 PM - HEC 450

Smart sensors with embedded control and communication links have the potential to improve the quality of service in healthcare, infrastructure maintenance, and energy conservation. This presentation provides an overview of our research activities on smart radar sensors. Starting from basic motion measurements, the scope of applications extends to sleep study, baby monitor, indoor localization, and civil engineering. Specifically, our recent research efforts on smart house, tumor tracking, and structural health monitoring will be discussed. In a smart house, radar provides localization, health condition, occupancy and human gesture information, benefiting the human well-being and energy efficiency. In cancer radiotherapy, because lung tumors can move significantly with respiratory motion, it is difficult for radiotherapy to deliver sufficient radiation dose without damaging the surrounding healthy lung tissue. We investigate radar-based accurate tumor tracking, which provides a method to dynamically target tumors with the radiation beam. In structural health monitoring, we use sensors with active transponders to advance infrastructure maintenance, as aging infrastructure remains a national concern with widespread impacts on the quality of our daily lives.

#### Dr. Changzhi Li

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Changzhi Li received the Ph.D. degree in electrical engineering from the University of Florida, Gainesville, FL, in 2009. In the summers of 2007–2009, he was with Alereon inc. Ausitn, TX, USA, and Coherent Logix inc. Austin, TX, USA, where he was involved with ultrawideband (UWB) transceivers and software-defined radio. He joined Texas Tech University as an Assistant Professor in 2009, and became an Associate Professor in 2014. His research interests include biomedical applications of microwave/RF, wireless sensor, and RF/analog circuits. Dr. Li is an associate editor for the IEEE Transactions on Circuits and Systems II.

He served as the TPC co-chair for the IEEE Wireless and Microwave Technology Conference in 2012 and 2013. He received the ASEE Frederick Emmons Terman Award in 2014, the IEEE-HKN Outstanding Young Professional Award in 2014, the NSF Faculty Early CAREER Award in 2013, and the IEEE MTT-S Graduate Fellowship Award in 2008. He is the advisor or co-author of nine best paper awards in IEEE conferences.

