SMU Department of Mechanical Engineering

SEMINAR

"Microwave Patch Antennas for Battery-less Wireless Sensing"

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Friday, March 23, 2012
3:00 p.m. – 4:00 p.m.
Location: Caruth 379

Abstract: **Sensor technologies are the foundation of all "smart" technologies, e.g. mobile health, robotics, smart grid, environmental monitoring, structural health monitoring, etc. A major challenge for sensor research is to achieve densely distributed, wireless, low power consumption sensor networks. This talk presents our study of microwave patch antenna sensors to address this challenge. We discovered that a microstrip patch antenna can be designed to sense various physical parameters, such as strain, pressure, shear, and crack etc. Because the patch antennas serves the dual function of sensing and data transmission, battery-less wireless interrogation of the antenna sensors can be achieved. In addition, frequency-division multiplexing can be exploited to simultaneously interrogate multiple sensors simultaneously. These unique characteristics make microwave antenna sensor an attractive candidate for densely distributed wireless sensor networks. The operating principles of the antenna sensors will be explained firs, followed by the discussions of two wireless interrogation schemes. The applications of the wireless sensors for strain and crack monitoring will be presented.**
Prof. Haiying Huang is an associate professor of the department of Mechanical and Aerospace Engineering at the University of Texas Arlington. She has a PhD degree in Aerospace Engineering and a master degree in Electrical Engineering; both from the Georgia Institute of Technology. Prof. Huang has published 29 journal papers, 40 conference papers, and has 9 patents/disclosures. She is a recipient of the 2009 NSF CAREER award and the 2007 Air Force Summer Faculty Fellowship. Prof. Huang is a member of the ASME, IEEE, and AIAA.

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