

SMU Department of Mechanical
Engineering
SEMINAR

**“Contact and Impact Analysis in
Multibody Dynamics”**

Professor Alan Bowling

Department of Mechanical and Aerospace Engineering,
University of Texas Arlington

Friday, April 27, 2012

3:00 p.m. – 4:00 p.m.

Huitt-Zollars Pavilion

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 first, 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.

Bio: Prof. Alan Bowling is from Austin, Texas and obtained his Bachelor's degree in Aerospace engineering from the University of Texas at Austin in 1988. After graduating he worked for McDonnell Douglas Space Systems Company in Houston, Texas for two years before going to graduate school at Stanford University and obtaining a Masters degree as well as a Ph. D. in Mechanical engineering in 1998. After graduation he pursued entrepreneurial activities in California for about three years. He joined the faculty at the University of Notre Dame in 2001 and moved to

The University of Texas at Arlington in 2008. Prof. Bowling's interests lie in the areas of multibody dynamics, design, and control with a focus in robotic legged locomotion, as well as biomechanics at different length scales.