IEEE Co-Sponsor

11:30 a.m. – 12:30 p.m.

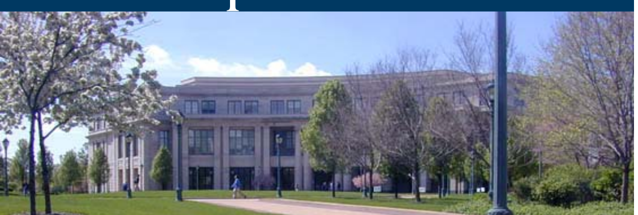
Tuesday – October 18, 2011

White 411

Dimitrios Peroulis
Purdue University

Department Colloquium

Electrical Engineering and Computer Science



CASE WESTERN RESERVE UNIVERSITY EST. 1826

MEMS Devices for Reconfigurable Communication Systems

Abstract

This seminar will begin by reviewing the state of the art in commercially-available RF MEMS and sensors. The focus will be on discussing specific challenges that have prevented some of the most promising MEMS devices in becoming commercially available and new methods for addressing them. We seek solutions at the fabrication technology, device, and sub-system levels. As an example, we will present unique three dimensional architectures for obtaining base-station quality tunable microwave filters in mobile form factors. These filters simultaneously exhibit a very wide tuning range (>2:1) and a very high quality factor (Q>1,000) at 6 GHz and beyond. Besides MEMS for RF systems, we will also briefly discuss inherently-reliable harsh-environment MEMS sensors for the health monitoring of aircraft engines. These sensors have demonstrated reliable operation up to 500C and have successfully identified operating condition changes and imminent failures when attached to ball/roller bearings rotating up to 50,000 rpm.

Bio

Dimitrios Peroulis received his PhD in Electrical Engineering from the University of Michigan at Ann Arbor in 2003. He has been with Purdue University since August 2003 where he is currently leading a group of graduate students on a variety of research projects in the areas of RF MEMS, sensing and power harvesting applications as well as RFID sensors for the health monitoring of sensitive equipment. He has been a PI or a co-PI in numerous projects funded by government agencies and industry in these areas. He is currently a key contributor in two DARPA projects at Purdue focusing on 1) very high quality (Q>1,000) RF tunable filters in mobile form factors (DARPA Analog Spectral Processing Program, Phases I, II and III) and on 2) developing comprehensive characterization methods and models for understanding the viscoelasticity/creep phenomena in high-power RF MEMS devices (DARPA M/NEMS S&T Fundamentals Program, Phases I and II). Furthermore, he is leading the experimental program on the Center for the Prediction of Reliability, Integrity and Survivability of Microsystems (PRISM) funded by the National Nuclear Security Administration. In addition, he is heading the development of the MEMS technology in a U.S. Navy project (Marines) funded under the Technology Insertion Program for Savings (TIPS) program focused on harsh-environment wireless micro-sensors for the health monitoring of aircraft engines. He has over 140 refereed journal and conference publications in the areas of microwave integrated circuits, sensors and antennas. He received the National Science Foundation CAREER award in 2008. His students have received numerous student paper awards and other student research-based scholarships. He is a Purdue University Faculty Scholar and has also received eight teaching awards including the 2010 HKN C. Holmes MacDonald Outstanding Teaching Award and the 2010 Charles B. Murphy award, which is Purdue University's highest undergraduate teaching honor.

CASE WESTERN RESERVE UNIVERSITY
CASE SCHOOL OF ENGINEERING

Electrical Engineering & Computer Science Dept. 216-368-2800
email: eecs@eecs.case.edu

This is to certify that ____________________________ attended this seminar. Certified by ________________________ Certificates of attendance and other evidence of CPD activity should be retained by the attendee for auditing purposes.