

Technical Seminar Series 2010

GUEST SPEAKERS

Prof. Lin Liwei (University of California at Berkeley)
Prof. Fang Weileun (National Tsing Hua University)

When: **17th Aug 2010, 10.00 a.m. to 12.00 noon**
Where: **Institute of Microelectronics, Singapore**
11 Science Park Road Singapore Science Park II Singapore 117685

Prof. Lin Liwei
University of California at Berkeley
Title: Nanogenerator for Electric Clothing

Abstract

A self-powering system that harvests its operating energy directly from the environment/body movement is an attractive proposition for sensing, personal electronics and security technologies. Mechanical energy scavenges by orderly electrospun piezoelectric nanofibers enable energy generation which could eventually leads to “electric clothing.” This talk will introduce recent results on the demonstration of a single nanogenerator made of polyvinylidene fluoride (PVDF) via the in-situ stretching and poling electrospinning process. Results show that energy conversion efficiency of nanogenerator could be 10 times higher than large scale structures made of the same material. The capability of demonstrating electrospun nanofiber as possible power generator could have a profound impact in various application areas, including energy harvesting, strain sensing, and actuation sources.

Biography



Professor Lin Liwei received his Ph.D. degree from the University of California, Berkeley, in 1993 and is now Chancellor's Professor at the Mechanical Engineering Department and Co-Director at Berkeley Sensor and Actuator Center, an NSF/Industry/University research cooperative center. He served as the Vice-Chair for graduate study for the Mechanical Engineering department from 2006-2009. His research interests are in design, modeling and fabrication of micro/nano structures, sensors and actuators as well as mechanical issues in micro/nano systems including heat transfer, solid/fluid mechanics and dynamics. Dr. Lin is the recipient of the 1998 NSF CAREER Award for research in MEMS Packaging and the 1999 ASME Journal of Heat Transfer best paper award for his work on micro scale bubble formation. He led the effort in establishing the MEMS sub-division in ASME and served as the founding Chair of the executive committee for the MEMS division in ASME. He holds 13 U.S. patents in the area of MEMS and NEMS.

Prof. Fang Weileun
National Tsing Hua University

Title: Towards the Sensors Implementation and Integration using CMOS MEMS Platform

Abstract

The CMOS MEMS process has the advantage of monolithic integration of the IC and micro mechanical components. In addition, the mature CMOS fabrication processes are available in many IC foundries. Thus, the CMOS-based micro fabrication technology provides a promising approach to implement MEMS devices. Presently, various CMOS-based MEMS sensors have been reported, for instance, the inertial sensors, chemical gas sensors, microphones, and pressure sensors. This presentation will introduce a novel double-side CMOS post-process established by the speaker's group to realize various capacitance type CMOS MEMS sensors. In addition, the design and monolithic integration of various capacitive sensors, such as 3-axis accelerometers, pressure sensors, and tactile sensors, using the standard TSMC 2P4M CMOS process will be demonstrated. Other sensor integration can also be achieved by using the same approach. The presented CMOS MEMS platform shows a promising architecture for the existing CMOS technology while moving towards the era of "More than Moore."

Biography



Prof. Fang was born in Taipei, Taiwan. He has been working in the MEMS field for 20 years. He received his Ph.D degree from Carnegie Mellon University (Pittsburgh, PA) in 1995. His doctoral research focused on the determining of the mechanical properties of thin films using micromachined structures. In 1995, he worked as a postdoctoral research at Synchrotron Radiation Research Center, Taiwan. He joined the Power Mechanical Engineering Department at the National Tsing Hua University (Taiwan) in 1996, where he is now a Professor as well as a faculty of NEMS Institute. From June to September 1999, he was with Prof. Y.-C. Tai at California Inst. Tech. as a visiting associate. He has established a world-class MEMS testing and characterization lab. His research interests include MEMS with emphasis on micro fabrication/packaging technologies, CMOS MEMS, micro optical systems, micro sensors and actuators, and characterization of thin film mechanical properties.

Prof. Fang has published more than 100 SCI journal papers, near 150 international conference papers, and 60 patents (all in MEMS field). He is now the Board Member of JMM (SCI journal), and the Associate Editor of JM3 (SCI journal). He has served as the chief delegate of Taiwan for World Micromachine Summit since 2008. He also served as the TPC (Technical program committee) of IEEE MEMS'04, MEMS'07, and MEMS'10, the TPC of Transducers'07, and the EPC of Transducers'09 and Transducers'11. He has become the member of international steering committee of Transducers from 2009. Moreover, Prof. Fang also serves as a technical consultant for many MEMS companies in Taiwan.

Registration

Pre-registration is required.
Closing date is 13th Aug 2010.

To register, please log on:

http://eostar.eventshub.sg/ems_wb_Details.aspx?CallID=28&EventID=127000

Location Map

