USC Viterbi School of Engineering
Ming Hsieh Department of Electrical Engineering

Seminar Announcement

Electrical Engineering Ph.D. Student Seminar Series

Tuesday, April 23, 2013

12:00pm – 1:00pm EEB248

Speaker: Chuan Wang, Postdoctoral Scholar, University of California, Berkeley and 2010-11 MHI Ph.D. Scholar

Talk Title: Carbon Nanotube Macroelectronics: Applications in User-Interactive Electronic Skin

Talk Abstract: In this talk, I will discuss the recent advancements in solution-based processing of high-purity semiconducting carbon nanotube networks, which has led to macro-scale fabrication of thin-film transistors (TFTs) with excellent yield, high performance, small device-to-device variation, and extreme bendability on mechanically flexible substrates. The superior mobility, room-temperature processing, and long term air-stability show the immense promise of the solution-processed carbon nanotubes as a competitive TFT technology platform for low-cost high-performance flexible electronics. A wide range of electronic components including digital logic circuits, radio-frequency transistors, and active-matrix backplane have been demonstrated using the carbon nanotube TFTs. Going further, I will present the heterogeneous integration of three distinct electronic components (TFTs, large-area sensor networks, and organic light-emitting diodes) on a single piece of skin-like substrate for a fully functional electronic system. The system functions as a user-interactive electronic skin (e-skin) that is capable of spatial and temporal mapping of a wide range of stimuli and provides instantaneous response through a seamlessly integrated AMOLED display. The enabled interactive e-skin represents a new class of smart macro-scale electronics which can be laminated on virtually any object while providing sophisticated human-surface interfacing at an unprecedented level. The presented platform could find a wide range of applications in robotics, interactive input devices, automotive control panels, smart wallpapers, and medical and health monitoring devices.

Biography: Dr. Chuan Wang is currently a postdoctoral scholar in Prof. Ali Javey's research group at University of California, Berkeley. After receiving his B.S. in Microelectronics from Peking University in 2005, he joined University of Southern California in 2007 working as a research assistant in Prof. Chongwu Zhou's research group and received his Ph.D. in Electrical Engineering in 2011. During his graduate studies, he pioneered in the field of using purified semiconducting carbon nanotubes and CVD-grown horizontally aligned carbon nanotubes for high-performance thin-film transistors, integrated circuits, display electronics, and RF electronics. Dr. Wang's current focus areas of research include flexible electronics, stretchable electronics, roll-to-roll printed electronics, and RF electronics using various types of nanomaterials including carbon nanotubes, graphene, 2D III-V nanomembranes, and layered dichalcogenides. He has authored and co-authored 29 journal papers with 475 citations and a total impact factor of 291 as of 03/05/2013. Most of his papers are published in high impact journals including Nature Communications, Chemical Society Reviews, Nano Letters, and ACS Nano.

Refreshments provided

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