NANOMATERIALS SPEAKER SERIES

EPIDERMAL ELECTRONICS FOR MOBILE SENSING AND THERAPY

November 18, 2016 at 12:30pm

Engineering Building 2, Rm W122

Bio-tissues are soft, curvilinear and dynamic whereas wafer-based electronics are hard, planar, and rigid. Over the past decade, high-performance inorganic stretchable electronics have emerged as a result of smart structural designs such as filamentary serpentines and unique materials processing methods such as micro-transfer printing. Epidermal electronics represent a class of stretchable circuits and sensors that are ultrathin, ultrasoft, skin-conformable, and deformable just like a secondary skin. This talk introduces a new "cut-and-paste" method to fabricate epidermal sensors within minutes. This method has been proven to work for thin film metal, polymer, ceramics, and 2D materials. I will demonstrate the unique advantages of epidermal electronics as a mobile platform for continuous vital sign monitoring, human-machine interface, as well as personalized therapeutics. Examples include sensors for electroencephalogram (EEG), electrocardiogram (ECG), electromyogram (EMG), skin temperature, skin hydration, respiratory rate, blood pressure, as well as sweat (e.g. glucose and lactate). Epidermal heaters and drug delivery micro-needles with closed-loop feedback control will also be discussed.

Nanshu Lu

Assistant Professor

Department of Aerospace Engineering and Engineering Mechanics

University of Texas at Austin

SPEAKER BIO

Nanshu received her Bachelor's degree from Tsinghua University, Beijing and Ph.D. from Harvard University. She joined UT Austin in 2011 after her postdoctoral training at UIUC. She has 54 journal publications with more than 3000 citations in the field of flexible and bio-integrated electronics. She was named 35 innovators under 35 by MIT Technology Review and is the receiver of NSF CAREER Award, Air Force and Naval Research Young Investigator Awards, and 3M Non-Tenured Faculty Award.

Contact Professor Cunjiang Yu at cyu@central.uh.edu if you would like to arrange for a time to meet with Dr. Lu.

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Electrical & Computer Engineering