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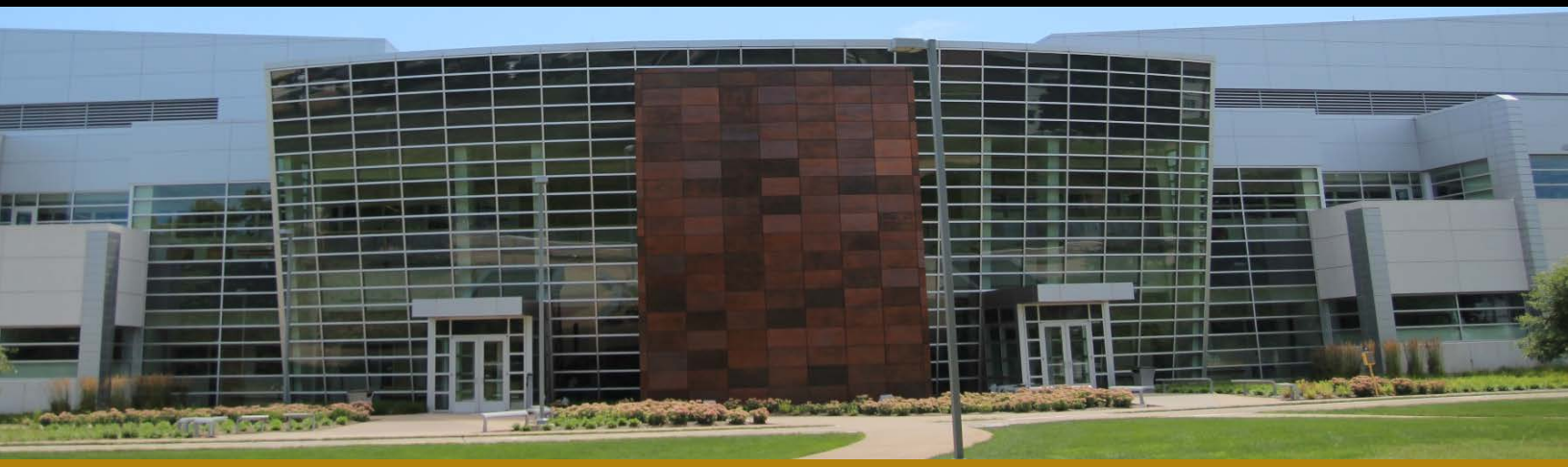

BNC Distinguished Seminar

Wearable Sweat Sensors - Towards big data for human health

Ali Javey

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Professor of Electrical Engineering and Computer Sciences, UC Berkeley

Friday, March 8, 2019
1:00pm – 2:00pm, MRGN 121

Bio: Ali Javey received a Ph.D. degree in chemistry from Stanford University in 2005, and was a Junior Fellow of the Harvard Society of Fellows from 2005 to 2006. He then joined the faculty of the University of California at Berkeley where he is currently a professor of Electrical Engineering and Computer Sciences. He is also a faculty senior scientist at the Lawrence Berkeley National Laboratory where he serves as the program leader of Electronic Materials (E-Mat). He is a co-director of Berkeley Sensor and Actuator Center (BSAC). He is an associate editor of ACS Nano.

Javey's research interests encompass the fields of chemistry, materials science, and electrical engineering. His work focuses on the integration of nanoscale electronic materials for various technological applications, including low power electronics, flexible circuits and sensors, and energy generation and harvesting. He is the recipient of MRS Outstanding Young Investigator Award (2015), Nano Letters Young Investigator Lectureship (2014); UC Berkeley Electrical Engineering Outstanding Teaching Award (2012); APEC Science Prize for Innovation, Research and Education (2011); Netexplorateur of the Year Award (2011); IEEE Nanotechnology Early Career Award (2010); Alfred P. Sloan Fellow (2010); Mohr Davidow Ventures Innovators Award (2010); National Academy of Sciences Award for Initiatives in Research (2009); Technology Review TR35 (2009); NSF Early CAREER Award (2008); U.S. Frontiers of Engineering by National Academy of Engineering (2008); and Peter Verhofstadt Fellowship from the Semiconductor Research Corporation (2003).

Abstract: Wearable sensor technologies play a significant role in realizing personalized medicine through continuously monitoring an individual's health state. To this end, human sweat is an excellent candidate for non-invasive monitoring as it contains physiologically rich information. In this talk, I will present our recent advancements on fully-integrated perspiration analysis system that can simultaneously measure sweat rate, metabolites, electrolytes and heavy metals, as well as the skin temperature to calibrate the sensors' response. Our work bridges the technological gap in wearable biosensors by merging plastic-based sensors that interface with the skin, and silicon integrated circuits consolidated on a flexible circuit board for complex signal processing. This wearable system is used to measure the detailed sweat profile of subjects engaged in prolonged physical activities, and infer real-time assessment of physiological state of the subjects.

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