CMOS Sensors and Circuits for Biomolecular and Cell Culture Systems

Jennifer Blain Christen
School of Electrical, Computer and Energy Engineering, Arizona State University

Abstract
Prof. Blain Christen will present complete systems integration for CMOS-based systems for in vitro and ex vitro biological assays. She will examine CMOS-based sensors as well as techniques to improve their performance taking advantage of CMOS-based fabrication. She will then describe some of the systems designed by her group including both the sensors and readout circuits. These chips are embedded in microfluidics, and a new technique for packaging is presented. Finally she will discuss the concept of multi-modal feedback (these are multi-physics systems so the implementation of feedback necessitates sensing and actuating using different physics). The complete system enables a new class of assays resulting from application of engineering principles to biological research.

Biography
Jennifer Blain Christen received a B.S. (1999), M.S. (2001) and Ph.D. (2006) in electrical and computer engineering from Johns Hopkins University. Her dissertation focused on hybrid systems for life science applications exemplified through the development of a micro-incubator for cell culture. Blain Christen held a Graduate Research Fellowship and a G K-12 fellowship both from the National Science Foundation. In her post-doctoral work at the Johns Hopkins School of Medicine in the Immunogenetics Department, she developed a microfluidic platform for homogeneous HLA (human leukocyte antigen) allele detection. Her research interests involve design of analog and mixed-mode integrated electronics for direct interface via innovative fabrication techniques to aqueous environments with special emphasis on biological materials.

Date: Thursday, April 24, 2014
Time: 5:00-6:00 PM Presentations (Pizza will be served following the Seminar)
Location: Group Conference Rm, Bldg 94, Freescale Semiconductor, 2100 E. Elliot Rd, Tempe, AZ Use Freescale Main Entrance (South) facing Elliot Road

For more information, contact:
Steve Rockwell (WAD Chapter Chair) (480) 241-9891 steve.rockwell@ieee.org
Vishwanath Natarajan (Chapter Publicity) (404) 428-0514 vishwanath.natarajan@ieee.org

WAD Website: http://ewh.ieee.org/r6/phoenix/wad/