



Biomedical Microsystems: Challenges and Opportunities

Abstract:

Recent advances in MEMS transducers, microfluidics, advanced functional materials, and low-power wireless communication have provided a unique opportunity to fabricate high performance microsystems with increased performance and functionality. My laboratory at Purdue University has been involved in research and development in this area with a particular emphasis on implantable wireless microsystems for a variety of diagnostic, therapeutic, and rehabilitative applications. In this seminar, I will describe our efforts in three areas: 1) hydrogel-based microsystems for physiological sensing and active flow control, 2) implantable microsystems for diagnosis and management of glaucoma, and 3) implantable wireless dosimeters for radiation oncology. Using these specific examples, I will describe opportunities and challenges facing successful implementation and ultimate clinical utilization of such microsystems.

Bio:

Babak Ziaie received his doctoral degree in Electrical Engineering from the University of Michigan in 1994. His dissertation was related to the design and development of an implantable single channel microstimulator for functional neuromuscular stimulation. From 1995-1999 he was a postdoctoral-fellow and an assistant research scientist at the Center for Integrated Microsystems (CIMS) of the University of Michigan. He subsequently joined the Electrical and Computer Engineering Department of the University of Minnesota as an assistant professor (1999-2004). Since Jan 2005, he has been with the School of Electrical and Computer Engineering at Purdue University where he is an associate professor. His research interests are related to the biomedical applications of MEMS and Microsystems (BioMEMS). These include implantable wireless microsystems, smart polymers for physiological sensing and active flow control, micromachined interfaces with the central nervous system, biomimetic sensors and actuators, and ultra-sensitive sensors for biological (molecular and cellular) applications. Dr. Ziaie is the recipient of the NSF Career award in Biomedical Engineering (2001) and McKnight Endowment Fund Award for Technological Innovations in Neuroscience (2002). Dr. Ziaie is a member of the IEEE and the American Association for the Advancement of Science.

Date:
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Time:
1:30 PM

Belknap Research Building Room 139

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