

Development of Nanomaterial-based Smart Patches and Low-cost MEMS Devices

Speaker: Cihan Yilmaz, PhD - Flex Boston Innovation Center, Boston, MA 02210

E-Mail: Cihyilmaz@gmail.com

Abstract

Flex Boston Innovation Center is a concepting, design & short run production facility that supports the regional innovation economy from large multinational customers to startups. This presentation will include some of the recent work on MEMS sensors and their applications in consumer and healthcare. In the first part of the presentation, the development of a smart patch that measures accumulating lactic acid or glucose in sweat and alerts the user in real-time the chemical level will be covered. Various building blocks including the sweat sensor technology, the material and the design of a patch, the location on the body for testing, the microfluidic system concept, and the development of electrical hardware and software will be discussed. The sensor test result will also be presented.

In the second part, the design and fabrication of a low-cost ultrasonic transducer will be presented. The development of the system architecture for a transducer and system level test will be demonstrated. Several aspects of the system including the transducer material composition and availability, new fabrication techniques, and the methods for bonding multiple layers of the transducer will be discussed.