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Self-packaged Flexible Microsensors

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Department Colloquium

Electrical Engineering and Computer Science

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ABSTRACT

Novel emerging sensor technologies and applications require low-cost, adaptable, and scalable, wafer and device level packaging. We present several designs for device-level self-packaged thermal detectors, pressure sensors, MEMS resonators and accelerometers. Both rigid Si substrates and flexible polyimide substrates are discussed. Device level packaging is necessary for optimum sensor performance without sacrificing flexibility.
The use of flexible substrates is attractive since they can conform to non-planar objects, can be batch fabricated at low cost and enable multilayer construction. This could facilitate integration of multi-functional sensory arrays on single flexible substrates, so called 'smart-skin' for simultaneous and real-time sensing of various mechanical, biological and chemical elements. Our group has reported the design, modeling and simulation of micromachined integrated pressure–thermal sensors on flexible polyimide substrates.

Zeynep Çelik-Butler is Professor of Electrical Engineering and Director of Nanotechnology Research and Teaching Facility at the University of Texas at Arlington. She received dual B.S. degrees in electrical engineering and physics from Bogaziçi University, Istanbul, Turkey, in 1982. She received the M.S. and Ph.D. degrees in electrical engineering in 1984 and 1987, respectively, from the University of Rochester. She joined the Department of Electrical Engineering at Southern Methodist University in 1987 and promoted to Associate Professor in 1993. She served as the Assistant Dean of Graduate Studies and Research from 1996 to 1999. She moved to University of Texas at Arlington in 2002. Dr. Çelik-Butler is a senior member of IEEE, member of Eta Kappa Nu, and the American Physical Society. She is a Distinguished Lecturer for the IEEE-Electron Devices So

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