



TECHNOLOGY

Ultra-Miniature Fiber-Optic Pressure Sensor Array System

OVERVIEW

As sensors become integrated in more and more applications, there is a need for scalable fabrication techniques that can yield sensors with uniform properties and which have identical thickness and cavity lengths. Furthermore, fabrication techniques that allow for manufacturing of uniform sensors having nanometer thicknesses could be of immense significance in the fields of biomedical diagnostics and military surveillance.

Researchers at the department of Mechanical Engineering at the University of Maryland, College Park have developed an ultra-miniaturized pressure sensor array system, including a unique fabrication technique for sensor manufacturing and a high performance interrogation subsystem. The sensor elements in the subject miniaturized subsystem feature a low-finesse Fabry-Pérot cavity structure having a nano-meter scale metal-polymer composite diaphragm.

The key advantages of the above unique fabrication technique are as follows:

- 1) The fabrication technique allows for batch production of sensors that yield good device-to-device uniformity.
- 2) Multiple sensors can be fabricated simultaneously and have identical diaphragm thickness and cavity length.
- 3) The fabrication technique follows simple processes that can be carried out without a cleanroom environment and equipment.
- 4) The fabrication technique enables fabrication of thin diaphragms with nanometer thicknesses.
- 5) The sensors are biocompatible.

Further, the novel interrogation subsystem is immune to environment perturbations, and yields highly sensitive, low noise results at high speed and high resolution. The above system could be extremely useful in the areas of space-constrained biomedical diagnosis and treatment that require minimal invasive, in vivo monitoring of the pressures of blood, bones, joints, bladders, etc. Due to the nano scale thickness of the diaphragms, these sensors could be used as miniature microphones for various surveillance and industry applications.

For additional information, please contact the Office of Technology Commercialization, University of Maryland College Park, via phone at (301) 405-3947 or e-mail at otc@umd.edu.

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

Additional Information

INSTITUTION

University of Maryland, College Park

CATEGORIES

- Sensors/Monitors

EXTERNAL RESOURCES

PS-2007-105