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Beyond Sensible Shoes
Flexible Fabric of Microsensors May Lead to Smart Clothing

By Alexandra Robbins
PC Magazine

March 22— The phrase "second skin" may soon refer to garments far more intriguing than curve-clinging clothes draped on supermodels. Unlike that version of second skin, the new version doesn't elicit reactions; it monitors them.

Smart Skin, still in development, is made of a flexible material embedded with microsensors that mimic the signal sending of nerve cells. The sensors, which wirelessly communicate with receiving devices, can already monitor temperature and infrared radiation and are expected to detect pressure, touch, and even vital signs.

The work being done on Smart Skin is part of a big ramp-up in research on microelectromechanical systems, or MEMS, which are expected to imbue many kinds of inanimate objects with the intelligence to sense and communicate. Spouses Zeynep Celik-Butler and Donald Butler brought the project to the University of Texas at Arlington with a $300,000 grant from the National Science Foundation.

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Smart Skin has many potentially promising applications. Microsensors on a flexible substrate allow for smaller, lighter designs than those based on rigid wafers, and Donald Butler predicts that "in the long term, electronics is going to move toward flexible materials."

Not Just for Humans

One of the primary applications for Smart Skin may be detecting signs of an illness or emergency such as SIDS: An infant's pajamas could alert parents to temperature, pressure, and pulse changes. Soldiers, industrial workers, and astronauts could wear Smart Skin clothing or gloves embedded with chemical sensors that alert them to nearby toxicity.

Butler also hopes Smart Skin will shake up the field of robotics. With sensors distributed across its entire surface, a robot might gain more autonomy and greater perception. Nanorobots and tiny flying vehicles could acquire improved surveillance capabilities.

Smart Skin will go into production in approximately five years, says Butler. By then, your clothes may know a lot more about you. ■