technology*scanning*

Information Technology

This category includes innovations in wireless and other information technology areas.

Electro-Textiles

Electro-textiles are conductive materials that are woven or integrated into fabrics. These fabrics offer alternative methods for data and power transmission than are currently in use. They can be used to produce such diverse and imaginative applications as roll-up keyboards, jackets that interface with your mobile phone or pc, a television remote control sewn into the arm of a sofa, or light switches embedded in curtains and carpets.

The U.S. Army and several companies are working to integrate these materials into military clothing. This would enable clothing to transmit signals to equipment a soldier is carrying. This technology will turn otherwise passive clothing and other fabrics into an integral part of the soldier's electronic/communications systems. One project focused on integration of a USB cable into fabrics, since USB is commonly used with desktop computers. The cable arrangement was manufactured as a thin, flexible material.

Several companies are producing pressure sensitive fabrics which also may hold great promise for applications in housing. Pressure sensitive fabrics are produced using quantum tunnelling composites (QTC) with unique pressure controllable switching properties. In their normal state these fabrics are insulators. However, when pressure is applied, the resistance decreases until the fabric achieves metal-like conductivity. With the use of these products, interior environmental conditions can be changed using wearable switches or by touching wall coverings. These fabrics can also be used as sensors to monitor the

Courtesy: U.S. Army

A Universal Serial Bus (USB) cable was manufactured into a thin, flexible and wearable cable with flat, low-profile connectors that can be integrated into clothing.

occupancy of interior spaces as a means of saving energy.

To date the vast majority of applications for electro-textile materials has been in the apparel industries. A potential use in homes is wiring imbedded into contruction materials.

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Sensatex (smart textile manufacturer – smartshirt system)
New York Office
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Phone: (212) 334-2525

Typical RFID tags, shown below, have the size and flexibility of an address label and allow remote reading and writing from up to several meters without requiring a clear line of sight between reader and tag.

An example of a RFID Reader.

Phone: (650) 934-8000
www.savi.com

CECOM (Army Communication Electronic Command)
Research and Development Engineering
Fort Monmouth, NJ
Phone: (908) 532-0353

Manufacturers:
Texas Instruments, Dallas, TX
www.ti-rfid.com

Intermec, Everett, WA
www.intermec.com

Alien Technology,
Morgan Hill, CA
www.alientechnology.com

Philips Semiconductors,
Eindhoven, Netherlands
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SCS
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Radio Frequency Identification Devices

RFID creates an automatic way to collect information about a product, place, time or transaction quickly, easily and without human error. It provides a contactless data link, without need for line of sight or concerns about harsh or dirty environments that restrict other auto ID technologies such as bar codes. In addition, RFID is more than just an ID code, it can be used as a data carrier, with information being written to and updated on the tag.

RFID systems consist of a number of components including tags, handheld or stationary readers, data input units and system software. The tags are the backbone of the technology and come in all shapes, sizes and read ranges including thin and flexible "smart labels" which can be laminated between paper or plastic.

The idea for Radio Frequency Identification (RFID) technologies has been around for decades, but their application has been held back in part by the expense of the tags, which ranges from just under $1 to $20. Now the potential cost has dropped to about a nickel, as sponsors of the commercially funded Auto-ID Center at Massachusetts Institute of Technology have figured out ways to produce inexpensive chips in quantity based on developing standards.

RFID technology could be used in construction for inventory control, improving inspection efficiency, and to track job progress.

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Savi Technology
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Video Encoder/Decoder Cards

Coastcom's new Encoder and Decoder Video II cards use state-of-the-art technology to achieve superior picture quality. These enhanced cards function with over two times the quality/bandwidth of the latest and most popular standards – H.263 and MPEG-4. Typical current applications include transportation monitoring, video conferencing, and remote video surveillance. A videoconferencing set-up can include Video Encoder/Decoder Channel Cards, video cameras, PCs, and audio equipment at each site. A company with multiple offices could use videoconferencing to enhance communication and promote employee interaction. Continued enhancements of this technology could lead to building industry applications in the areas of enhanced project management tools and remote construction

inspection systems.

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Tactile Pressure Sensors and Measurement Systems

The I-Scan® System by Tekscan is a versatile pressure measurement system using Tekscan's patented thin-film pressure sensing technology. At the system's heart is a tactile sensor capable of measuring pressures as low as 5 mmHg and as high as 175 MPa. Sensors measure approximately 0.1 mm in thickness. Output can be monitored in 2-D or 3-D on a computer using software provided by Tekscan. Tekscan's wide pressure range has enabled them to pursue applications varying from mattress design to stress analysis of concrete support structures. Potential applications include door seal force measurement, high-speed impact studies, gasket and seal analysis, fastener and clamp load analysis, and fabric and material density measurement. Specific housing applications may include monitoring during or after events such as earthquakes or hurricanes.

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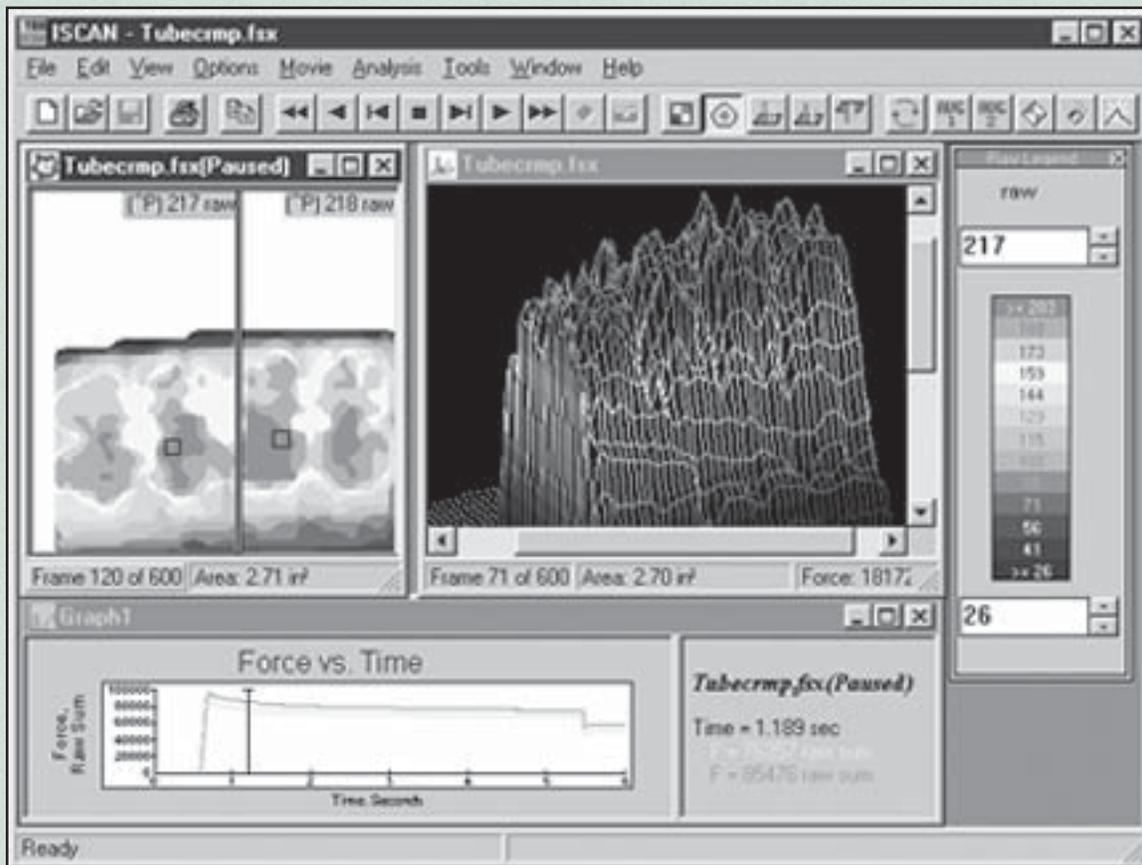
Courtesy: Tekscan, Inc.

The I-Scan® software system displays the pressure and force information as it happens (in 'real time') on the computer screen, in vibrantly colored 2D or 3D images. Dynamic tests can also be recorded as a "movie", and played back with operating controls similar to a home VCR.