SMART FABRIC: A REVIEW

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Abstract-This technology is based on advanced computer technology, specially in the areas of small wireless technology and www(world wide web)networking**, the views of wearable computers emerge. A lot of manageable electronic devices are using now a days, like cell phones, notebooks and organizers. The next step in networking can be to create really wearable computer that are included in our routine days clothes always serve as our personal associate. This paper explain and inform us a textile point of views. New functions have textile points. It is also have a combination of textiles and electronics devices ? What sort of smart clothes can be realize? Mainly important steps of textile research and examples of current developments are offered as well as future challenges.**

Keywords— **fabric sensors, textile sensors, e-textiles**

I. INTRODUCTION

Electronic textiles (e-textiles) are fabrics that have electronics and interconnections natural fiber into them. Components and interconnections are a part of the fabric and thus are much less observable and, more highly, not subject to becoming tangled collectively or snag by the background. accordingly, e-textiles can be worn in everyday situations where currently available wearable computers would hold back the user. E-textiles also have greater flexibility in adapting to changes in the computational and sensing requirements of an application. The number and position of sensor and processing elements can be

dynamically modified to the current needs of the user and application, rather than being fixed at design time. Wearable computers can now merge seamlessly into normal clothing. Using a range of conductive textiles, data and power allocation as well as sense circuitry can be included directly into wash-and-wear clothing

II. TEXTILES GAIN INTELLIGENCE

Advances in textile technology, computer engineering, and resources science are promote a new type of functional fabrics.

Fashion designers are adding wires, circuits, and optical fibers to usual textiles, creating garments to glow in the dark or keep the wearer warm. Meanwhile, electronics engineers are sewing conductive threads and sensors into body suits that map users' whereabouts and respond to environmental stimuli. Researchers agree that the development of genuinely interactive electronic textiles is technically possible, and that challenges in scaling up the handmade garments will eventually be overcome. Now they must determine how best to use the technology.

Fig. 1 Optoelectronic fabrics may find a market in the world of interiordesign owing to their originality and aesthetic appeal. (Courtesy of Maggi)Orth, International Fashion Machines.)

III. WEARABLE INTELLIGENCE

Self-heating hats and glow-in-the-dark sweatshirts might correctly be labeled as 'smart', but how about a shirt that 'knows' whether you are free to take a cell phone call or retrieve information from a 1000 page safety manual displayed on your inside pocket? Such items, termed 'intelligent' clothing to distinguish them from their lowertech cousins, have proved more difficult to patch unobtrusively into everyday apparel. Indeed, the first prototype 'wearable computers' of the early 1990s required users to strap on a head-mounted visor and carry heavy battery packs in their pockets, leading some to question the appropriateness of the term 'wearable'.

Fig. 2 A Lady wear smart jacket

IV. WEARABLE ANTENNAS

In this program for the US Army, Foster-Miller integrated data and communications antennas into a soldier uniform, maintaining full antenna performance, together with the same ergonomic functionality and weight of an existing uniform. We determined that a loop-type antenna would be the best choice for clothing integration without interfering in or losing function during operations, and then chose suitable body placement for antennas. With Foster-Miller's extensive experience in electro-textile fabrication, we built embedded antenna prototypes and evaluated loop antenna designs. The program established feasibility of the concept and revealed specific loop antenna design tradeoffs necessary for field implementation.

Fig .3 Wearable Antenna into a soldier uniform

V. GEORGIA TECH WEARABLE MOTHERBOARD

Georgia Tech developed a "Wearable Motherboard" (GTWM), which was initially intended for use in combat conditions.

Georgia Tech's research was funded by the US Department of Navy. The Sensate Liner for Combat Casualty Care uses optical fibers to detect bullet wounds and special sensors that interconnects in order to monitor vital signs during combat conditions. Medical sensing devices that are attached to the body plug into the computerized shirt, creating a flexible motherboard. The GTWM is woven so that plastic optical fibers and other special threads are integrated into structure of the fabric. There are no discontinuities in the GTWM. The GTWM is one piece of fabric, without seams. Because the sensors are detachable from the GTWM, they can be placed at any location, and is therefore adjustable for different bodies. Furthermore, the types of sensors used can be varied depending on the wearer's needs. Therefore, it can be customized for each user. For example, a firefighter could have a sensor that monitors oxygen or hazardous gas levels. Other sensors monitor respiration rate and body temperature or can collect voice data through a microphone.

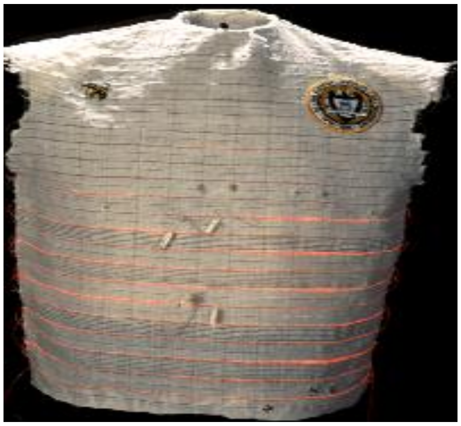

Figure 1: the third generation GTWM

Figure 2: the GTWM worn underneath combat fatigues

VI. Other Uses for the GTWM

in calculation, the "Smart Shirt" can be tailored to fit anyone, like any other shirt. For example, a baby wearing a GTWM could have his or her very important signs monitored. This would be especially helpful while some babies are level to unexpected baby death syndrome (SIDS), which often strikes without warning during sleep.

Fig .4 An infant wears a tailored "Smart Shirt"

VII. FABRIC COMPUTING INTERFACES

Designing with unusual materials can create new user attitudes towards computing devices. Fabric has many physical properties that make it an unexpected physical, interface for technology. It feels soft to the touch, and is made to be worn against the body in the most intimate of ways. Materially, it is both strong and flexible, allowing it to create malleable and durable sensing devices. Constructing computers and computational devices from fabric also suggests new forms for existing computer peripherals, like keyboards, and new types of computing devices, like jackets and hats.

A. Sensitive fabric surface

Creating sensors that are soft and malleable and that conform to a variety of physical forms will greatly change the way computing devices appear and feel. Currently, creating beautiful and unusual computational objects, like keyboards and digital musical instruments, is a difficult problem. Keyboards today are made from electric contacts printed on plastic backing. These contacts are triggered by mechanical switches and buttons. Digital musical instruments rely on film sensors, like Piezoelectric and resistive strips. All these sensors require rigid physical substrates to prevent de-lamination, and the mechanical incorporation of bulky switches. This drastically limits the physical form, size and tactile properties of objects using these sensors.

B. Two Fabric Keypad

Our fabric keypads offer far better physical flexibility and softness than existing flexible keyboards. Unlike fabric sense of the past, these keyboards present the accuracy and repeatability necessary to create dependable sensing devices. These keypads can be used to interface with Fig. 2 Quilted Fabric Keypad, Flat, Folded and rolled everything from a desktop computer, to a pager and an interactive clothing.

Fig .7 Quilted Switch Matrix Keypad

C. *Musical Jacket*

The Musical Jacket incorporates an embroidered fabric keypad, a sewn conducting fabric bus, a battery pack, a pair of commercial speakers and a miniature MIDI synthesizes.

Fig .5 Musical Jacket

D. *Firefly Dress and Necklace*

The Firefly dress and necklace uses conductive fabric to distribute power throughout the dress. As the wearer moves, LED's (small lights) to which we attached fuzzy conductive p ads (the electrical contacts), brush lightly against the fabric power and ground layers, creating a dynamic lighting effect. The necklace,(having no power supply of its own), creates dynamic light effects when its conducting beads and tassels brush against the surface of the dress. These "opportunistic" connections allow power to be distributed without hard and fast connectors and wires. The dresses design is reminiscent of the 1920's and suggests a level of detail and romance rarely associated with technology.

Fig .7 Firefly Dress and Necklace

VIII. CONCLUSION

What smart fabrics cannot is not as important as what it can. This smart textiles have managed to saturate into those places where you smallest amount expect to find them. That is the real magic of knowing them. It can produce a many of wild imaginations which are not impossible. Right from the technically versatile battlefield of the future to the very core of wearable, enveloping, everywhere computing technologies that have vow to make computing an activity so securely bound with the normal life, will the smart fabrics make their incidence feel.

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