WEARABLE COMPUTER

A Project Report Submitted
for

Information Technology

By

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CERTIFICATE

This is to certify that the project entitled **"Wearable Compuer"** being submitted to **Evergeen Senior Secondary School, Haldwani** for the project work of **INFORMATION TECHNOLOGY** is a record of the work carried by Mr. **PRAVEEN KUMAR JOSHI** under my guidance and supervision.

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ABSTRACT

Current portable computers and PDA's fail to truly become part of our daily lives in the sense that we need to stop what we are doing and expend conscious effort to use them. They also do not have the situational awareness that they should have: while they are not being explicitly used, they are unable to remain attentive to possible ways to help the user. In response to these problems, a personal, wearable and multimedia computer that perceives and responds to the wearer's affective state offers a new kind of perceptual interface. Instead of asking the user to continuously select preferences from a menu, the affective wearable gets to know its wearer's preferences by recognizing and responding to signals that carry emotional information.

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(Harshit Kapil)

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INTRODUCTION

A wearable computer is a computer that is subsumed into the personal space of the user, controlled by the user, and has both operational and interactional constancy, i.e. is always on and always accessible. Most notably, it is a device that is always with the user, and into which the user can always enter commands and execute a set of such entered commands, and in which the user can do so while walking around or doing other activities. This transformation allows it to be worn constantly, with the goal of becoming a seamless extension of body and mind, equipped with various sensors which measure heart rate, respiration, footstep rate etc, and can help in body maintenance. The 'wearable computer' apparatus is embedded within nontransparent clothing which provides shielding.

Electronic circuits are built entirely out of textiles to distribute data and power and perform touch sensing .The most salient aspect of computers, in general, (whether wearable or not) is their reconfigurability and their generality, e.g. that their function can be made to vary widely, depending on the instructions provided for program execution. With the wearable computer (Wear Comp), this is no exception, e.g. the wearable computer is more than just a wristwatch or regular eyeglasses: it has the full functionality of a computer system but in addition to being a fully featured computer, it is also inextricably intertwined with the wearer. This is what sets the wearable computer apart from other wearable devices such as wristwatches, regular eyeglasses, wearable radios, etc. Unlike these other wearable devices that are not programmable (reconfigurable), the wearable computer is as reconfigurable as the familiar desktop or mainframe computer

HISTORY

The concept of wearable computing was first brought forward by Steve Mann, who, with his invention of the 'Wear Comp' in 1979 created a pioneering effort in wearable computing. Although the effort was great, one of the major disadvantages was the fact that it was nothing more than a miniature PC. Absence of lightweight, rugged and fast processors and display devices was another drawback.

The 1980s brought forward the development of the consumer camcorder, miniature CRTs etc. brought forward the development of the eyeglass mounted multimedia computer. With the advent of the internet and wireless networking technologies, wearable devices have developed a great deal. After its invention wearables have gone through 18 generations of development, with research going on at prestigious institutions like MIT, Georgia Tech and Carnegie Mellon University.

What is a Wearable Computer?

A wearable computer is a computer that is engulfed into the personal space of a user, controlled by the user, and has both operational and interactional constancy. Most notably, it is a device that is always with the user, and into which the user can always enter commands, and execute a set of such entered commands, and in which the user can do so while walking around or doing other activities. i.e. The wear comp is a intertwined computer. Unlike wristwatches, regular eyeglasses, wearable radios, etc. the wear computers are reconfigurable as the regular desktop PCs. Wearable computing can be defined in terms of its three basic modes of operation and its six fundamental attributes.

Figure 1

Wearable Technology

Smart Glass
It can click photos, record video, provides navigation, live video sharing facility and can act as translator.

Wristbands
These bands will track health related activities, such as heart rate, calories burned during workout and how much steps you have covered yet.

Smart T-Shirt
It is a computer built into the threads which will supply processing power to other devices. It will also track distance covered, calories burned & intensity of movement.

Smart Trouser
These are built with special threads which will take energy from the wearer's movement & will help in charging other devices.

Smart Watch
Apart from showing time you can answer calls, view messages, run third party apps and can also use it as a navigator.

Smart Shoes
In this, insoles are connected with phone & it tracks walking activities. We can also feed destinations in insole; they will vibrate whenever you have to take the turn.

Figure 2

The six attributes of wearable computing –

There are six informational flow paths associated with this new human – machine synergy. These signal flow paths are called attributes of wearable computing, and are described below.

1. Un monopolizing of the user's attention: It doesn't cut you off from the outside world like a virtual reality game does. You can attend to any other job while using the apparatus. It is built keeping in mind that computation is a secondary activity, giving attention primary importance. In fact, it can provide you with enhanced sensory capabilities.

2. Unrestrictive to the user: Ambulatory, mobile etc… i.e. you can do other things while using it. E.g.: You can type while jogging, etc.

3. Observable by the user: It can get your attention continuously if you want it to. The screen is visible throughout, except when you close your eyes.

4. Controllable by the user: Highly responsive. You can grab control of it at any time you wish. Even automated processes can be broken, so that the user can be a part of the loop any time he wants to. E.g.: A HALT button can serve in stopping the loop being executed when files are opened one behind the other when you press the "return" key after selecting a block of files.

5. Attentive to the environment: Environmentally aware, multisensory. As a result, this gives the user increased situational awareness.

6. Communicative to others: Can be used as a communication medium when you want it to. It doesn't block you from expressing your feelings.

Features of Ideal Wearable Computing Devices

- ➢ **Consistency:** The signal flows from human to computer and computer to human uninterruptedly to provide constant user interface.

- ➢ **Persistence:** These wearable are designed for everyday and continuous use over a lifetime.

- ➢ **Enhancement:** The assumption of the wearable computing is that the user is occupied with some other task along with computing. Thus, the gadget should serve to enhance the intellect or augment the senses.

- ➢ **Convenient:** It should be convenient to user.

- ➢ **Unrestrictive:** Wearable devices enable a person to do multitasking.

- ➢ **Interact seamlessly:** Adapts its input and output modalities to those most appropriate at the time.

Figure 3

__CONCLUSION__

People are carrying more and more electronic products: mobile Phones, Personal hi-fis etc. Smart clothing is a combination of electronics and clothing textiles. These intelligent clothes are worn like ordinary clothing and will help in various situations according to the designed application. A piece of clothing works and helps actively to carry out a mission such as drying. A piece of clothing usually
dries hanging, it requires a certain time to dry, so this means a passive drying.

Active drying can be accomplished with humidity sensor which notices humidity growing up and puts heating on. Therefore dissipating of water is more effective. Active characters of smart clothing can be heating, Cooling, changing of colour and active drying. Computerized Clothes will be the next step in making computers and devices portable without having to strap electronic gadgets onto our bodies. The intimate nature of clothing is that it is always with us and that we select accord, suggests a new trend or 'smartness' on people.