Wearable Sensor for Health Monitoring

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***Abstract*— In Today's tautness life people are facing multiple physical, physiological, psychological problems. They have no time to visit doctors again and again. Sometimes there is a situation when a patient requires treatment on the spot. To solve these problems we require a technique which collects all the data about people's disease in spaces ranging from personal to urban. Wireless sensor network (WSN) technologies.**

Keywords*— *GPRS=Global Packet Radio Service LCD= Liquid Crystal Display

I. INTRODUCTION

In Today's tautness life people are facing multiple physical, physiological, psychological problems. They have no time to visit doctors again and again. Sometimes there is a situation when a patient requires treatment on the spot. To solve these problems we require a technique which collects all the data about people's disease in spaces ranging from personal to urban. Wireless sensor network (WSN) technologies are considered one of the key research areas in computer science and the healthcare application industries for improving the quality of life. The main focus of this work is to implement the health monitoring system continuously without hospitalization using wearable sensors. Wearable sensors monitor the parameters of the human body like temperature, pressure, heart beat and respiratory by using sensors and also display them in the LCD. The GPRS is used to communicate the collected sensor information to internet.

II. HOW WEARBLE SENSOR WORKS

There have been several successful cases where technologies have moved out of the clinic to monitor patients going about their day-to-day life over extended periods. Perhaps the most notable of these is the ECG Holter monitor for detecting arrhythmias. Wearable sensor systems are progressively becoming less obtrusive and more powerful, permitting monitoring of patients for longer periods of time in their normal environment. Current commercially available systems are compact, enclosed in durable packaging, and utilize either portable local storage or low-power radios to transmit data to remote servers. The development and refinement of novel fabrication techniques, sustainable power sources, inexpensive storage capacity and more efficient communication strategies are critical to continue this trend towards "wear and forget". Sensors are primarily used to monitor three types of signals: activity, physiological and environmental. Data from these sensors can be collected, analyzed and made available to the wearers, caregivers, or healthcare professionals with the goal of improving the management and delivery of care, engaging patients and encouraging independent living. In addition to passive monitoring, interfacing with these sensors through local input and communication networks can be beneficial for engaging the wearer and may significantly impact adoption. For local input, flexible multi touch sensors have been developed which can be cut to any desired shape while for readout, a range of technologies from organic light emitting diodes (OLED) devices to electro chromic displays and thermo chromic indicators have been demonstrated in principle.

Flexible sensors, no longer constrained to planar geometries, have the potential to be one of the key technologies in helping to realize ubiquitous healthcare. The development of elastomeric and electrically-conductive polymers , ultrathin in organics and organic semiconductors have enabled flexible, stretchable electronic systems that can conform to daily life. It is the compatibility of these flexible sensors with daily life and the ease with which they interface with other information communication technologies that has driven the widespread experimentation and investigation of their use for healthcare. Using state of the art fabrication techniques, substrates and circuits approaching 1 μm in thickness, bending radii less than 10 μm and weighing less than 1 mg/cm2 , electronic devices can potentially be truly imperceptible . Non-invasive flexible healthcare devices fall into two main categories: electronic skins (e-skins) that adhere to the body surface and clothing based or accessory-based devices where proximity is sufficient. In addition to lightweight flexible electronics, rapid advances in material science have opened doors to other potential benefits including optically transparency. self-healing devices, light detection and harvesting and bio electrochemically powered sensors. Although demonstrated individually, many of these advances have yet to be integrated into a fully functional device that has been tested in a non-controlled human environment. A. Activity Monitors The analysis of movement can provide many insights into well-being, rehabilitation and fitness. Non-contact devices such as pedometers have been widely available for many decades. The concept of 10,000 steps representing the activity energy expenditure to balance the average calorific intake has been developed and refined over the past three decades and embraced by several public health campaigns. However, it has been the development of low-cost inertial sensors utilizing micro-electromechanical systems (MEMS), and sophisticated software for accurately detecting steps that has resulted in a dramatic rise in the availability and use of the personal activity monitors.

III. INTRODUCTION TO EMBEDDED SYSTEMS

An Embedded System is one that has computer hardware with software embedded in it as one of its important components. An embedded computer is frequently a computer that is implemented for a particular purpose. In contrast, an average computer usually serves a number of purposes: checking email, surfing the internet, listening to music, word processing, etc. However, embedded systems usually only have a single task, or a very small number of related tasks that they are programmed to perform.

An embedded computer system is an electronic system, which includes a microcomputer .It is configured to perform a specific dedicated application. Software is programmed into Read Only Memory. This software is not accessible to the user of the device , and software solves only a limited range of problems .Here the microcomputer is embedded or hidden inside the system.

Each embedded microcomputer system, accepts inputs, performs calculations, and generates outputs and runs in “real time.”

For Example: A typical automobile nowadays contain an average of ten microcontrollers. In fact, modern houses may contain as many as 150 microcontrollers and on average a consumer now interacts with microcontrollers up to 300 times a day. General areas that employ embedded microcomputers encompass every field of engineering namely: Communications, automotive, military, medical, consumer, machine control etc.

IV. INTRODUCTION TO PROTUS CODING

The microcontroller can understand a program written in assembly language, it must be compiled into a language of zeros and ones. Assembly language and Assembler do not have the same meaning. The first one refers to the set of rules used for writing program for the microcontroller, while the later refers to a program on a personal computer used to translate assembly language statements into the language of zeros and ones. A compiled program is also called Machine Code. In machine code, the same command is represented by a 14-bit array of zeros and ones understandable by the microcontroller. All assembly language commands are similarly compiled into the corresponding array of zeros and ones. A data file used for storing compiled program is called an "executive file", i.e. "HEX data file". The name comes from the hexadecimal presentation of a data file and has a suffix of "hex" as well, for example "probe.hex". After has been generated, the data file is loaded into the microcontroller using a programmer. Assembly language programs may be written in any program for text processing (editor) able to create ASCII data files on a hard disc or in a specialized work environment such as MPLAB described later.

V. HOW WEARABLE SENSOR WORKS

One area of great promise is the integration of diagnostic and therapeutic systems into theranostic devices. Recently a multifunctional wearable device has been developed that records muscle activity and is integrated with a controlled trans dermal delivery system for releasing nano particles There are also many intriguing technologies being developed that may impact future device design. Spray-on sensors, and self-healing polymers are two examples of advances that may address some of the challenges with existing approaches in the longer-term. However, in the shorter term, the focus will potentially remain on integration and durability of technologies, improved algorithms for motion detection and validation of results against other technologies. The Block Diagram is given below in Fig.1.

VI. APPLICATIONS

- The Wearable Sensor is used in Home Industries
- The Wearable Sensor is used in Safety the Human Health Body.
- It can be used in a range of military applications such as AI certified Robots

VII. BLOCK DIAGRAM

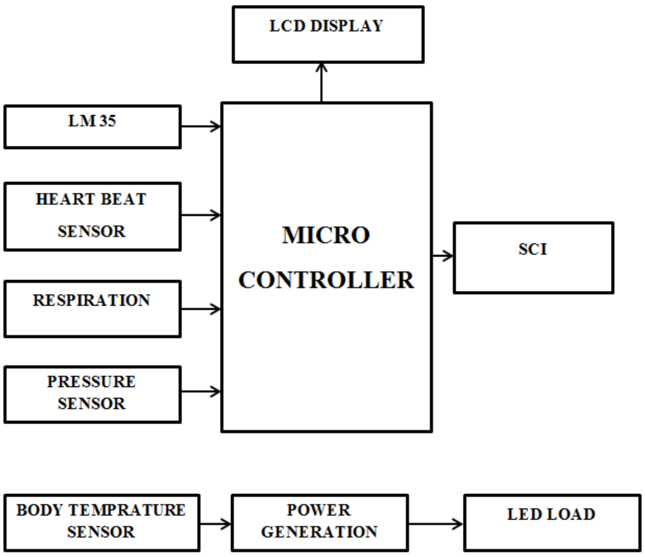

Fig. 1.

VIII. FUTURE SCOPE

Though the research and development on wearable devices has reached a stage where it can be used as normal household items, The high cost is still holding it back. From a commercial perspective, the prices of the product need to come down to a level so that people can afford them . There will be a huge market in a growing aging population in Asian countries.

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