

Design of Monitoring System for Human

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Abstract: *Healthcare costs is increase as age increase. The healthcare system is now transfer into system in which continuous monitoring of patient is possible. Without hospitalization continuous monitoring of patients is possible with help of smart sensing system. There are various system which develop smart system to monitor activities of the human being, such as embedded systems, wireless communication technologies. Smart sensing system based on the wearable sensor monitor all the physiological parameters of the patient along with other symptoms. Sensors detect abnormal situations by monitoring patient. In this we propose smart sensing system more light-weight, high-performance wearable devices will be available for monitoring a wide range of activities of human being.*

Keywords: Wearable sensors, smart sensors, sensor networks, wireless sensor networks, body sensor networks, body area networks, activity monitoring, assisted living, smart home, physiological parameters monitoring

1. Introduction

For emergency help panic button is used as wearable sensor. The panic button is mostly comfortable to wear 24/7 so it should be light in weight.

In the medical field, patient's brain activity, body temperature, heart rate, muscle motion are continuous monitor. So with help of wearable sensor it is possible to monitor patient's activity continuously so that wearable sensor is very light sensors that could be worn on the body to perform monitoring of patients. Volume-oscillometric technique for measuring blood pressure using wearable sensor.

Use of Wearable sensor in sport as well as training is increase every day. Few years back it is not possible to measure swat rate without laboratory, but now it is possible with help of wearable sensor

Sometime it is necessary to monitor patients continuously. Such time with help of wearable sensor it is possible to give treatment at home. Diseases like heart attack, Parkinson, sleep apnea require continuous monitor with the help of wearable sensors has made it possible to have the necessary treatment at home. Sometime Patients follow strict routine for recovery such time monitoring with help of wearable sensor. With the help of wearable sensors all physical activities of the patient are possible to be monitored. According to the requirement of individual patient system of sensor is manufacture. All The activity of the patients are monitored by doctors, nurses or caregivers with the help of remote.

To detect falls of elderly within the home smart sensing system is developed. Fall every year increase and it increases to one in two for the age of over eighty years. Due to fall major problems of health may occur. Immediate help needs to be provided for the elderly to reduce the risk of complications. If anyone is not present the elderly may suffer pain, so that medical complication arises, it is dangerous.

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 along with the developed countries but the price point has to come down. As per the estimate, the wearable consumer devices such as fitness trackers, smart glasses and smart watches will be sold over 40 million in 2014 and will be approximately 100 million in 2015.

The other challenge for wearable electronics to be successful is to sustain the interest so that it is not only being considered as only a shiny object but also a useful one with adequate functionality. The consumers need to be convinced that it is not only notification but beyond that. The data from the wearable sensors may be used for long-term health monitoring and may predict the future health condition. The security issue needs to be properly addressed to make the monitoring system acceptable to the wider community without any fear and/or anxiety.

There is a huge glimpse of hope that wearable device, Apple Watch, will be with us which will be like strapping a computer on our arm. The watch is expected to be personal and intimate and is based on technology attempting to colonize our bodies. It is designed to track our movement, listen to our heartbeat and puts our whole body on line. The data from the wearable devices may be used to determine the emotion of the person under monitoring too, an experimental platform as shown in figure 6 has been reported. Or, may be the time will come when the whole computer may be fabricated in such a way that it will be possible for the human to wear it as a small device.

2. System Architecture

Architecture of the human activity monitoring system is very simple. Depending on the task which we have to monitor, different types of sensors are used for smart sensing system. The data from sensors are collected continuously by a processor. The collected data are processed in particular processor and then displayed on a display. Simple wearable sensor are used by normal people to measure the temperature of skin, heart-rate sensor. If the device has any feature of wireless data transmitting capability, then data can be sent to a central station. The data are processed in the processor and transmitted through a transceiver. Display is either in a graphical format or as a numerical value. The monitoring system may consists of many sensors to measure

physiological parameters. Physiological parameters like as body temperature as well as heart-rate etc. The sensing system consists of temperature sensor to measure the temperature of skin, heart-rate sensor as well as accelerometers are used to detect any fall . All the measured value of physiological data are collected by a microcontroller to process. The central controller generate a warning message based on the processed data which help to the caregiver

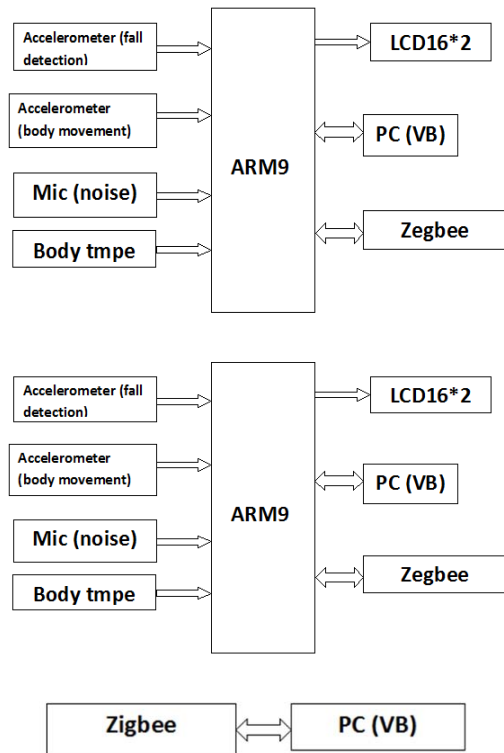


Figure: Proposed block diagram

3. Components Used in Proposed System

- 1) **MICROCONTROLLER UNIT: ARM9:**
 ARM9 operating at frequencies of up to 125 MHz, Full-speed USB 2.0 OTG, , 768 kB flash memory, external memory interface, three 10-bit ADCs. To optimize system power consumption, Clock Generation Unit (CGU) is present
- 2) **Liquid crystal display**
 LCD is used to see the output of the application. In proposed system 16x2 LCD used which indicates Lcd has 16 columns and 2 rows. Which indicate 16 characters in each line. So, in 16x2 LCD total 32 characters can display.
- 3) **Accelerometer**
 The ADXL335 is 3-axis accelerometer which has low power, thin accelerometer which gives voltage outputs. Minimum full-scale range of ADXL335 accelerometer is ±3 g. ADXL335 accelerometer measure the static acceleration of gravity .it measure dynamic acceleration from motion, shock, or vibration. In ADXL335 accelerometer X_{OUT}, Y_{OUT}, and Z_{OUT} pins is present.in this pins C_X, C_Y, and C_Z capacitors is present with the help of this bandwidth of the accelerometer is

measure. Rang of the X and Y axes is of 0.5 Hz to 1600 Hz.rang of Z axis is 0.5 Hz to 550 Hz.

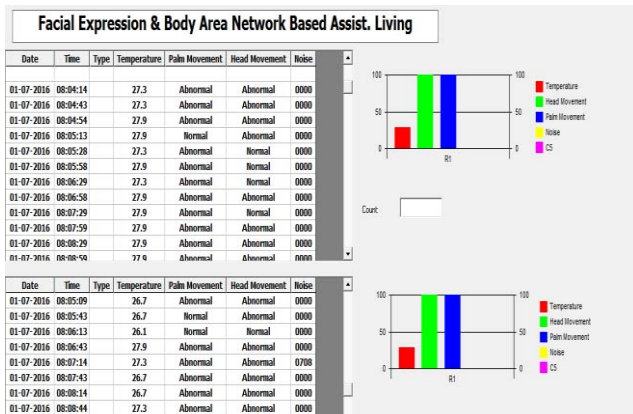
- 4) **RS 232**
 In our project the RS232 has the function to transfer the edited notice (or data) from PC (VB software) to the microcontroller, for the further operation of the system.
- 5) **Temperature sensor**
 To sense the temperature sensor is used. Here we have using LM35 temperature sensor. This temperature sensor can sense the temperature of the atmosphere around it .temperature sensor also sense the temperature of any machine. Output of temperature sensor is voltage is Celsius temperature. Which is converted into voltage linearly proportional with temperature. The LM35 series is available packaged in hermetic TO-46 transistor and it is precision integrated-circuit .it gives output in voltage form is linearly proportional.LM35C, LM35CA, and LM35D are also another available temperature sensor.
- 6) **LM386**
 The UTC LM386 is a power amplifier, designed for use in low voltage consumer applications. The gain is internally set to 20 to keep external part count low, but the addition of an external resistor and capacitor between pin 1 and pin 8 will increase the gain to any value up from 20 to 200.The inputs are ground referenced while the output automatically biases to one-half the supply voltage. The quiescent power drain is only 24 milliwatts when operating from a 6 voltage supply, making the LM386 ideal for battery operation
- 7) **XBEE**
 XBee and XBee-PRO Modules were engineered to meet ZigBee/IEEE 802.15.4 standards and support the unique needs of low-cost, low-power wireless sensor networks. The modules require minimal power and provide reliable delivery of critical data between devices. The modules operate within the ISM 2.4 GHz frequency band and are pin-for-pin compatible with each other

Software

- 1) Embedded C Programming in Keil
- 2) Circuit & Layout Designing: Proteus 7.7
- 3) Programming At Pc Using VB and Matlab

4. Result





5. Advantage

- Less time delays
- Quick response time
- Fully automate system
- Robust system
- Low power requirement
- Wireless communication

6. Application

- Medical
- Entertainment
- Security
- Commercial fields

7. Conclusion

A wearable wireless sensor network human activity recognition system is introduced in this paper and we can also integrated it with social network it to improve usability. Android mobile phone is applied as base station. In our existing system in future for monitoring a wide range of activities more light-weight, high-performance wearable devices will be available. The challenges faced by the current design will also be addressed in future devices. The development of light weight physiological sensors will lead to more comfortable wearable devices to monitor different ranges of activities.

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