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PORTABLE FRAMEWORK FOR BODY SENSOR SYSTEM

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ABSTRACT

Smart phones area unit quick growing within the IT market and it's the biggest fantastic of our everyday life. Its strongest strength is in its on-line quality. A smart phone has each basic capabilities as a mobile and intensive skills as an information communicator. The system provides a smart mobile system for a body sensor network that collects, displays, analyses and streams multiple device information to a centralized computing server. Multiple wireless protocols together with the Wi-Fi Communication are accustomed transmit device knowledge into an android Smartphone. A significant advantage of the android system is that the ability to speak with sensors information and performs the desired task. The projected smart sensing system is Wi-Fi technology to watch this information to over long vary of distances by connecting Wi-Fi into our smart phone.

Keywords: ***WI-FI, Heartbeat sensor, MEMS, Temperature***

I. INTRODUCTION

We discuss health observance as a possible application field for wearable sensors. we have a tendency to gift some usage models for health observance and discuss the technical necessities for the health-monitoring system supported wearable and close sensors, that live health-related knowledge in daily environments of the users or patients. The presentation is by no suggests that complete, however it aims to administer a thought of the system-level problems to be thought-about for real applications. The technology during this space is speedily developing, and doubtless we are going to proof emergence of those applications within the coming back years within the market.

A wireless detector network consists of an oversized variety of distributed nodes. The nodes are designed to be little, cheap and autonomous. Every node consists of a microcontroller, a transceiver, associate energy supply and a detector. The nodes are usually connected in associate ad-hoc arrangement. Wireless detector networks are deployed during a form of application areas, such as atmosphere and surround observation, tending and traffic control. Body space networks may be thought-about as a special variety of wireless detector networks with their own specific necessities. They disagree in nature and necessities from ancient wide area wireless detector networks, with the foremost necessary ones being the exaggerated demand for reliableness, energy potency and quality support.

II. LITERATURE REVIEW

In the present system, the Bluetooth technology is used to monitor the human's conditions using of different kind of sensors. The system which provides only measuring the conditions of the human's body like body temperature of the person by using Temperature sensor, Heart condition of that person to take heart beat using heart sensor along with weather the person is safely walking or skidding i.e. we are checking tilting actions of that particular person using MEMS sensor, etc. By taking all this information from relevant sensors, the information is directly pass through mobile phone using Bluetooth communication. In this system, the main drawback is range. We replaced Bluetooth with Wi-Fi communication, it is easy to monitoring the continuously data from sensors long distances.

We propose the system based on Wi-Fi technology. In existing system we are using Bluetooth Technology , by using Bluetooth module in this project we can't monitor on your mobile phones over long distances, so we are implementing smart idea like Wi-Fi module in this project which can also works on Bluetooth technology but it not provide to monitor the conditions of the person in mobiles over long distances, for that we use Wi-Fi module in that project, and information is gathering from relevant sensors and transmit this information using Wi-Fi communication. The Wi-Fi module can generate one unique IP address, by taking the that IP address in our mobile phone and accessing the information about the person need to Wi-Fi connection in our smart phones

III. HARDWARE DESIGN

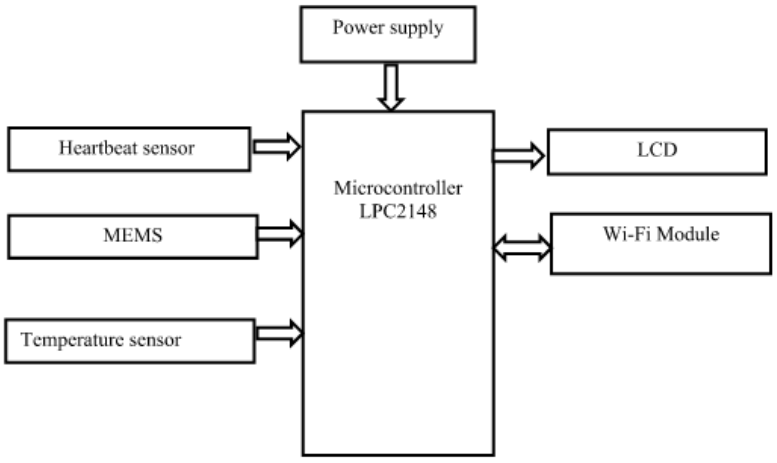

Fig 1: Block Diagram

It is composed of various hardware and software modules. The following block diagram indicates the evaluation of hardware components blanketed in the device.

3.1 LPC2148 Microcontroller

The LPC2148 microcontroller board based totally on a sixteen-bit/32-bit ARM7TDMI-S CPU with real-time emulation, sixteen-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package deal, 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory; 128-bit huge interface/accelerator allows high-pace 60 MHz operation, In- system Programming (ISP), unmarried 10-bit DAC affords variable analog output, 32-bit timers/outside event counters (with four capture and 4 examine channels every), PWM unit (six outputs) and watchdog, Low strength actual-Time Clock (RTC), more than one serial interfaces which includes two UARTs , rapid I2C-bus (400kbit/s), SPI and SSP with buffering and variable information length competencies.

3.2 WI-FI module

ESP8266 is an effective, low rate Wi-Fi module suitable for including wireless practicality to partner diploma existing microcontroller assignment thru a UART serial association. The module will even be reprogrammed to act as a standalone Wi-Fi linked tool–simply upload energy. The device which is communicate through AT Commands. The following commands represents the AT Commands.

- AT Command
- AT+RST
- AT+CWMODE=1
- AT+CWLAP
- AT+CWJAP=”SSID”,”PASSWORD”
- AT+CWLIF
- AT+CIPSTART=”TCP”,”192.168.88.35″, 80
- AT+CIPSEND=50
- GET /status.html HTTP/1.0\r\nHost: 192.168.88.35\r\n\r\n
- AT+CIPCLOSE

3.3 Temperature Sensor

Due to the fact we're the use of our temperature sensor on the farm fields we want high correct temperature sensor. We are going for the DS1621 that's actual time sensor. DS1621 can measure temperature form -55oC to +125oC with decision of ½oC. DS1621 temperature sensor is virtual sensor. To talk with the DS1621 we need to comply with I2C protocol. Which takes traces to talk. The two strains are SDA and SCK for information switch and clock respectively. Due to the fact DS1621 is actual time sensor we can get most accurate temperature of the environment. Since we are using virtual sensor instead of analogue sensor we can get accurate price with high resolution. In preference to high and low we will get the temperature cost that's ranging from –55 to +125oC. I2C protocol is referred to as Inter included communication. I2C protocol communicates in synchronous serial verbal exchange. So the facts loss in synchronous verbal exchange is less while in comparison to the Asynchronous conversation.

3.4 MEMS

MEMS (MMA7660) is an I2C based accelerometer. The primary motive of the MEMS is to degree the small alternate in movement of MEMS IC in all the x, y and z dimensions. To declare with MEMS MMA7660 IC we

need to followsynchronous serial exchange. In I2C protocol we need to state with MEMS accelerometer by way of sending clock in parallel with the information and additionally we acquire an acknowledgement. For the reason that we're the use of synchronous communique, data loss may be very less. There are specially three registers in IC which we've to check in c program language period timings via comparing the unique values we generally recognize the status of persons status.

Fig 2: MEMS sensor module

3.5 Heartbeat Sensor:

The heart beat detector circuit diagram contains a light-weight detector and a bright red crystal rectifier. The crystal rectifier must be of super bright intensity as a result of most lightweight passes and spreads if a finger placed on the crystal rectifier is detected by the detector. Now, once the centre pumps blood through the blood vessels, the finger becomes slightly a lot of opaque; because of this, less quantity of sunshine reaches from the crystal rectifier to the detector. With each heart pulse generated, the detector signal gets varied. The numerous detector signal is reborn into associate electrical pulse. This electrical signal gets amplified associated triggered through associate electronic equipment which provides an output of +5V logic level signal. The output is additionally directed by a crystal rectifier show that blinks on every heartbeat rate.

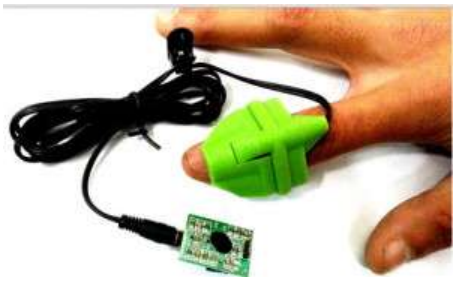

Fig 3: Heartbeat sensor

IV. SOFTWARE DESIGN

In this proposed gadget, as we used LPC2148 we want to use following software equipment to program for it.

1. Keil uVision
2. Flash Magic

The Keil uVision is an IDE for Embedded c language. In this IDE, we want to import the utilities and libraries according to the controller we're the use of. This IDE is very less difficult and in user friendly way to apply. It

consists of all the C/C++ compilers, assemblers, and debuggers in it. It simplifies the manner of embedded simulation and trying out in conjunction with Hex file technology.

The flash magic is a programming utility. The C/C++ software written in IDE may be processed into Hex document i.e. in .hex layout. By using hex file we dump the code into microcontroller and perform the task with respective application.

V. WORKING DESCRIPTION

The objective of project is to monitor the human body conditions with respective sensor such as heart beat, temperature and mems. We communicate the data through Wi-Fi-module. The Wi-Fi module is to monitor the corresponding sensor values and update data with respective IP address. Thus we will simply monitor the information from the sensor in a predefined manner. In this project the microcontroller plays a vital role to perform the desired task. The microcontroller we used in this project is ARM 7 LPC2148 which has several inbuilt features such as ADC, SPI, I2C, PWM, and RTC. The sensors which are interfacing directly with microcontroller and we write the code in such manner to communicate with the microcontroller and perform the specific task. The WI-FI module is interfaced with microcontroller which is used to measure the corresponding sensor data and monitor the information through IP address. The system can also view the data from a mobile phone, but it should require internet connection. We can easily monitor the data from sensors through internet connection via WIFI.

The following Diagram represents the overall flowchart of smart mobile system.

VI. RESULTS

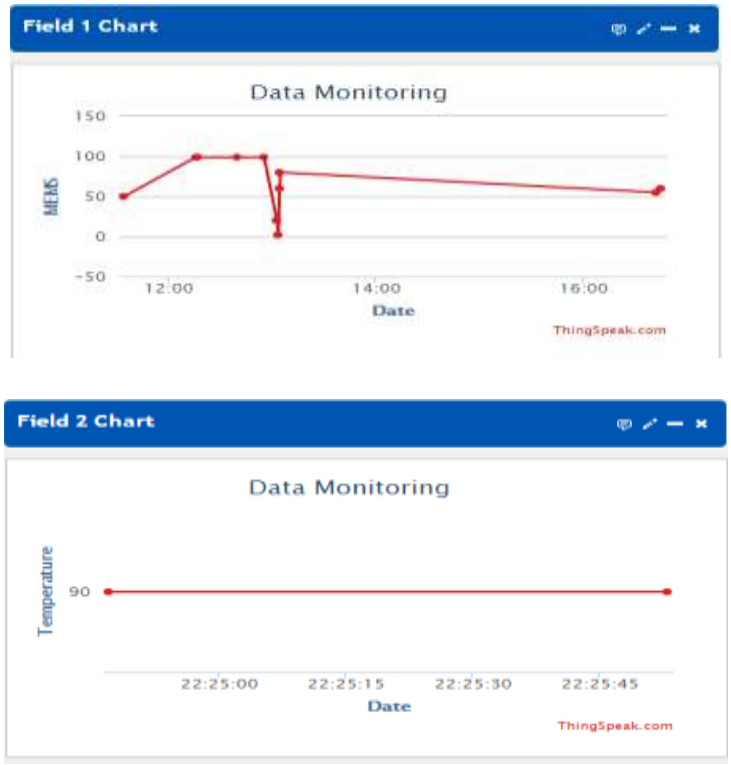

Fig 4: MEMS & temperature data monitoring in IP address using WI-FI module

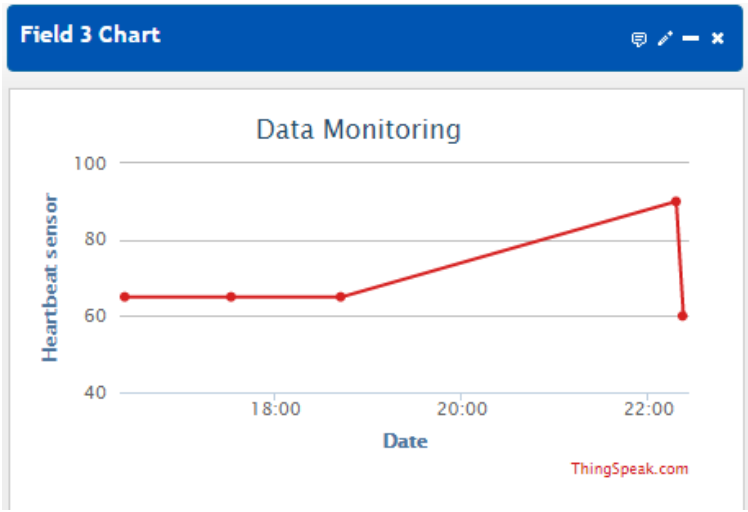

Fig5 : Heartbeat sensor values monitoring through IP address via WI-FI module

The above figure represents the overview of sensor data monitoring via Wi-Fi module through IP address. By mentioning IP address in web Brower, we can easily monitor the data from different sensor like heartbeat, temperature and MEMS in efficient manner .By implementing this concept we can use different applications like agriculture field, industries and so on etc.

VII. CONCLUSION

The implemented system is based on WIFI technology which is easily monitor the data of all sensor values and update the through IP address. The system is much efficiently to communicate the data in real time manner and also reliability in nature.

7.1 Future scope

We measure the data of corresponding sensors values but we didn't control the appliances like different sensors such as heartbeat, temperature and MEMS etc. By adding the following concept we can implement the project in two different manner. One is monitoring the appliances and another one is controlling the appliances with respective devices. For example, if heartbeat sensor is crosses the limit then we protect the person through GSM technology. By using this technology we give alertness through person when he is too critically condition. Hence we monitor as well as control the appliances in two different manner.

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