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HUMAN HEALTH MONITORING SYSTEM USING ANDROID MOBILE PHONE AND GPRS

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Abstract: ***Human health monitoring system is constructed using the ATMEGA16 microcontroller, pulse rate sensor, temperature sensor, and android mobile phone with inbuilt Bluetooth. The pulse rate sensor is used to measure the heartbeat. The heartbeat-per-mi-nute data is sent to the microcontroller, the temperature sensor and pulse sensor gets the data from microcontroller and produces the human pulse and tem-perature rate. This device alerts the patient and display what is the body con dition, how to overcome this problem without need proper physician guides' and save the money. Additionally, anGPRS transmission modem is used to send the data from pc to the mobile phone.***

1. INTRODUCTION

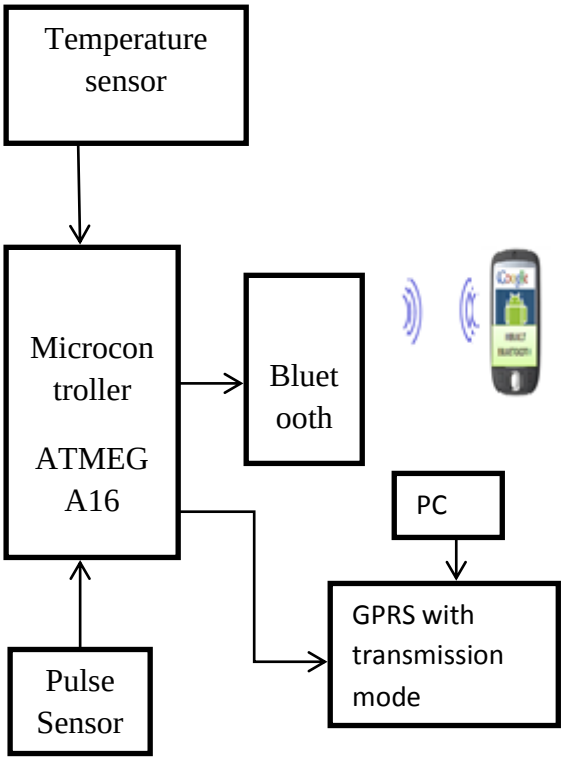
The previous research work we developed nonintrusive methods for simultaneous electrocardiogram, Photoplethysmograms, and Ballistocardiograms measurements. The measurements do not require direct contact between instruments and bare skin. These methods were applied to the design of a diagnostic chair for unconstrained heart rate and blood pressure monitoring purposes.If u done in any application used in the above methods. After that the sensing result should be transfer to the mobile phones through the wireless transmission. The mobile nodes are used to make one network with patient home and hospital management. This project has a panoramic view of sensors based mobile phones, which hasmore functions. For this, CHEMICAL and LIGHT sensorshave been used sensorbased mobile health monitoring system allows to closely monitoring the changes in the human body.

The MEMS sensor is placed in thn mobile phone is used to capture the serious medical conditions at that time. It is the small technology device distinct from hypothetical vision of molecular nanotechnology.Many serious condition was occur at various timing without known the patient like heart attack etc. so in this device is used to monitoring before the problem was created. The patient easy to known the diseases from the mobile phone alert messages and also monitor the patient information to the physicians. It continuously monitors the patient health condition if any variations occur in below or above to the normal range immediately it call to the patient home and also it call to the ambulance.

2. SYSTEM ARCHITECTURE

MEMS sensor based on mobile phone. It used to health monitoring system allows to closely monitoring the changes in the human body. It can alert the patient and also the medical person when they serious condition occur. In patient can have benefit from continuous long term health monitoring through the mobile without any guidance. In this project, we are going to implement Temperature Monitoring and Pulse Monitoring. And also we can Temperature, Pressure, Monitoring and Android using GPRS. This paper has a panoramic view of sensors based mobile phones, which has more functions. For this, Chemical and Light sensors have been used. If any variations occurred in this result immediately given alert message to the patient with display in

the mobile phone. In this device alert the patientand display what is the body condition, causes, how to overcome this problems without need proper physician guides' and save the money.



2.1Block Diagram

Advantages of the proposed system: It save money, it doesn't require any external power source.This device not needs more sensors and no need for manual guidance.

3. HARDWARE DESCRIPTION

A.ATMEGA 16:

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC (Reduced Instruction Set Computer) architecture. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed. The high-performance, low-power Atmel 8-bit AVR RISC-based microcontroller combines 16KB of programmable flash memory, 1KB SRAM, 512B EEPROM, an 8-channel 10-bit A/D converter, and a JTAG interface for on-chip debugging. The device supports throughput of 16 MIPS at 16 MHz and operates between 4.5-5.5 volts.By executing instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed. All the configurations in microcontroller is set through 8 bit (1 byte) locations in RAM (RAM is a bank of memory bytes) of the microcontroller called as Registers. All the functions are mapped to its locations in RAM and the value we set at that location that is at that Register configures the functioning of microcontroller. There are total 32 x 8bit registers in Atmega-16. As Register size of this microcontroller is 8 bit, it called as 8 bit microcontroller.

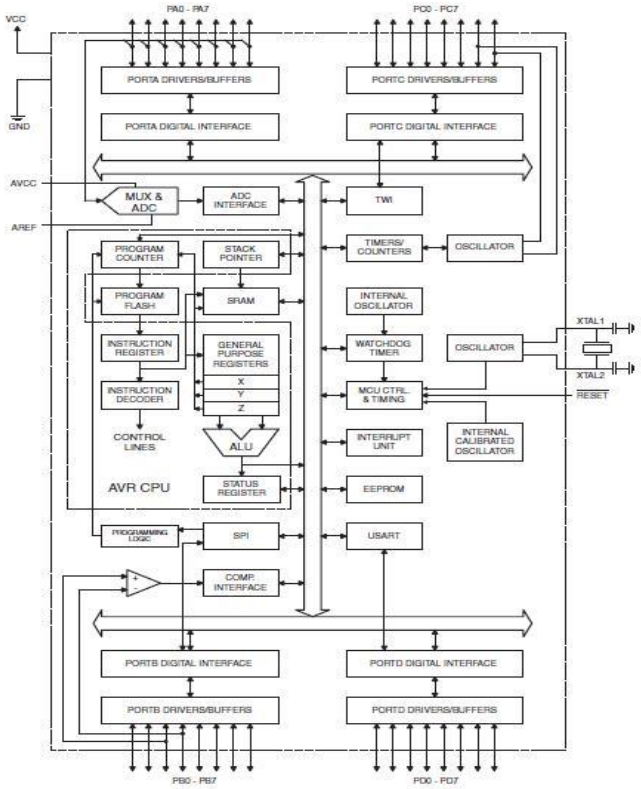


Fig A.ATMEGA 16 microcontroller

B.TEMPERATURE SENSOR (LM35):

The LM35is applied easily in the same way as other integrated-circuit temperature sensors. Glue or cement the device to a surface and the temperature should be within about 0.01°C of the surface temperature.This presumes that the ambient air temperature is almost the same as the surface temperature.

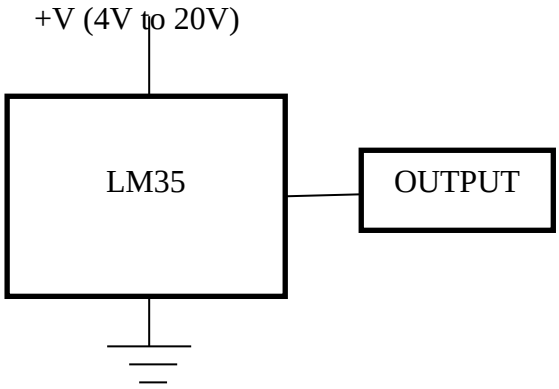


Fig B. Temperature Sensor

If the air temperature were much higher or lower than the surface temperature, the actual temperature of the LM35 die would be at an intermediate temperature between the surface temperature and the air temperature, which is especially true for the TO-92 plastic package where the copper leads are the principal thermal path to carry heat into the device, so its temperature might be closer to the air temperature than to the surface temperature.

C.PULSE RATE:

Pulse Sensor is a well-designed plug-and-play heart-rate sensor for Arduino. It can be used by Students, artists, athletes, makers, and game & mobile developers who want to easily incorporate live heart rate data into their projects. The sensor clips onto a fingertip or earlobe and plugs right into Arduino with some jumper cables. It also includes an open-source monitoring app that graphs your pulse in real time.

Pulse Sensor Kit

1) A 24-inch Color-Coded Cable, with (male) header connectors. You'll find this makes it easy to embed the sensor into your project, and connect to an Arduino. No soldering is required.

2) An Ear Clip, perfectly sized to the sensor. We searched many places to find just the right clip. It can be hot glued to the back of the sensor and easily worn on the earlobe.

3) 2 Velcro Dots. These are 'hook' side and are also perfectly sized to the sensor. You'll find these Velcro dots very useful if you want to make a Velcro (or fabric) strap to wrap around a fingertip.

4) Velcro strap to wrap the Pulse Sensor around your finger.

5) 3 Transparent Stickers. These are used on the front of the Pulse Sensor to protect it from oily fingers and sweaty earlobes.

6) The Pulse Sensor has 3 holes around the outside edge which make it easy to sew it into almost anything.

D. MEMS SENSOR:

MicroElectroMechanical systems (MEMS) are the technology of very small devices.MEMS are separate and distinct from the hypothetical vision of molecular nanotechnology or molecular electronics. MEMS are made up of components between 1 to 100 micrometers in size (i.e. 0.001 to 0.1 mm), and MEMS devices generally range in size from 20 micrometers (20 millionths of a meter) to a millimetre (i.e. 0.02 to 1.0 mm). They usually consist of a central unit that processes data (the microprocessor) and several components that interact with the surroundings such as microsensors[7]. At these size scales, the standard constructs of classical physics are not always useful. Because of the large surface area to volume ratio of MEMS, surface effects such as electrostatics and wetting dominate over volume effects such as inertia or thermal mass.

MEMS devices are defined as die-level components of first-level packaging, and include pressure sensors, accelerometers, gyroscopes, microphones, digital mirror displays, microfluidic devices, etc. The materials and equipment used to manufacture MEMS devices topped $1 billion worldwide in 2006. Materials demand is driven by substrates, making up over 70 percent of the market, packaging coatings and increasing use of chemical mechanical planarization (CMP). While MEMS manufacturing continues to be dominated by used semiconductor equipment, there is a migration to 200 mm lines and select new tools, including etch and bonding for certain MEMS applications.

MEMS sensor generations represent the progress made in micro sensor technology and can be categorized as follows:

1st Generation:MEMS sensor element mostly based on a silicon structure, sometimes combined with analog amplification on a microchip.

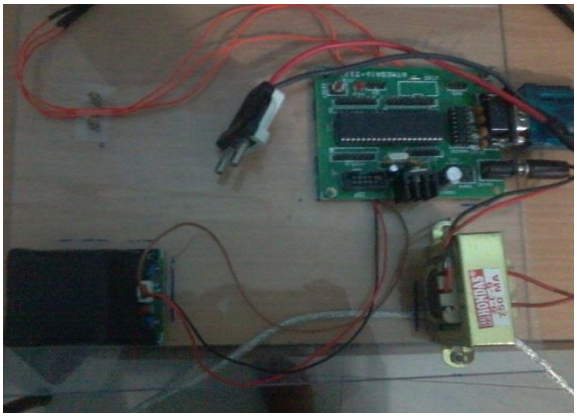
2nd Generation:MEMS sensor element combined with analog amplification and analog to digital converter on one microchip

3rd Generation: Fusion of the sensor element with analog amplification, analog-to-digital converter and digital intelligence for linearization and temperature compensation on the same microchip.

4th Generation: Memory cells for calibration- and temperature compensation data are added to the elements of the 3rd MEMS sensor generation.

4.EXPERIMENTAL OUTPUT

KIT DESIGN



The personal computer is connected with the hardware circuit to monitor the human body temperature and heart rate. The flash magic software is installed in the computer so it will show the temperature and heart rate values in the output screen.

5. CONCLUSION

In this project we can easily analyse the human body condition without need the doctor's advices. In this phase we develop a hardware based on microcontroller, pulse rate sensor, and temperature sensor. The output is displayed in pc using the USB.It show the results in the mobile phone by using the Bluetooth. The android mobile which is having the inbuilt Bluetooth.

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