



Patient Health Monitoring System Using Wi-Fi Module

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ABSTRACT: Now a day's technology is running with time, it completely occupied the life style of human beings. It is being used everywhere in our daily life to fulfill our requirements. We are employing different sensors for different applications sometimes we may even use same sensors differently for different applications. We can not only increase the speed of life but also increase security with good ideas by making use of advanced technology. In this project we are making use of technology to sense serious health problems so that efficient medical services can be provided to the patient in appropriate time.

This project calculate the heart rate and temperature by placing finger on the heart beat and in arms/ between two fingers/ in ear temperature sensor, smoke/ alcohol can be detect using sensor and button press to calculate the result, result of temperature, alcohol and heartbeat show on LCD screen and alerting beep or buzzer indicates the audio notification as we desired.

KEYWORDS: ATMEGA328 Microcontroller, wi-fi module , temperature sensor , heartbeat sensor.

I.INTRODUCTION

The functioning of heart rate measuring device is based on the truth that the blood circulates for every one heart beat which can be sensed by using a circuit formed by the combination of an IR LED (IR DIODE) and PHOTO DIODE. Depending upon the rate of circulation of blood per second the heart beat rate per minute is calculated by microcontroller. This device consists of a microcontroller which takes the input from the heart beat sensor and calculates the heart rate of the patient.

Temperature measurement is also done by temperature sensor calculate by arduino with internal ADC. The temperature sensor is required to place in two finger tips or in arms or in ear. Also detects the smoke or alcohol in breathing.

The main objective of this project is:

1. Real-time calculation of heart-bit rate of a person.
2. Real-time calculation of temperature rate of a human body.
3. Display the calculated heart-bit and temperature rate on LCD module and send via wi-fi module.
4. Beeps the buzzer in the system detects lower or upper level of heart beat or temperature.

II. TEMPERATURE SENSOR

The temperature monitoring unit consists of the components that are required to measure the temperature of the body. This unit comprises of a temperature sensor which measures the temperature of the body and is connected directly to a microcontroller. The temperature sensor that is used in this circuit is LM35 for the measurement of the body temperature. This temperature sensor is an analog sensor which produces an analog voltage by sensing the temperature. This sensor is held by the finger for a while (about 15 sec) in order to measure the body temperature. The body temperature on the body surface is about 1 degree centigrade less than the temperature of other parts. The analog voltage produced by the LM35 temperature sensor is directly proportional to the body temperature. The analog voltage needs to be converted to a digital value. The digital equivalence of analog voltage produced by LM35 sensor can now be used by the microcontroller for further processing. The microcontroller receives the data in analog form and converts it into digital form then sends it to the GSM module so that the data can be sent to the remote end. At the receiving end, a mobile device which utilizes the GSM system receives the message. The message received at the mobile device is displayed at the screen along with the data of heartbeat. The LM35 is a precision integrated circuit temperature sensor that is used here to measure temperature. The electrical output voltage of LM35 is linearly proportional to the celsius or centigrade temperature.

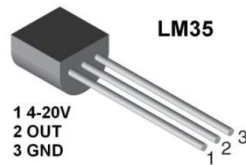


Fig1. Temperature sensor

III. HEARTBEAT SENSOR

Heartbeat sensor provides a simple way to study the function of the heart which can be measured based on the principle of psycho-physiological signal used as a stimulus for the virtual- reality system. The amount of the blood in the finger changes with respect to time.



Fig2. Arrangement Of Sensor

The sensor shines a light lobe (a small very bright LED) through the ear and measures the light that gets transmitted to the Light Dependent Resistor. The amplified signal gets inverted and filtered, in the Circuit. In order to calculate the heart rate based on the blood flow to the fingertip, a heart-rate sensor is assembled with the help of LM358 OP-AMP for monitoring the heartbeat pulses.

Features

- Provides a direct output digital signal for connecting to a microcontroller
- Works with a working Voltage of +5V DC

IV. ESP8266 WI-FI MODEM

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. This module comes with AT commands firmware which allows you to get functionality like arduino wifi shield, however you can load different firmwares to make your own application on the modules' memory and processor. Its a very economic module and has a huge and growing community support.

This module has onboard 80Mhz low power 32 bit processor which can be used for custom firmwares. This also means that you can host small webpages without any external controller. For more details see : [NODEMCU](#) . The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces, it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

ESP8266 is transforming the world with its low cost and high features which makes it an ideal module for Internet Of Things (IOT). It can be used in any application where you need to connect a device to your local network or internet.





V. ARDUINO

Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control both physically and digitally.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or breadboards (*shields*) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++.

VI.WORKING

12V-0-12V transformer is connected with rectifier diodes 1N4007 and filter of 1000uf/16V, DC output is directly connected to Arduino board and GSM modem, LM35, CO2, H.B sensor is required DC5V converted with LM7805 regulator IC (separate for each sensor). 1000uf capacitor filter is connected to cancel loading effect for each regulator. Arduino board analog inputs pin are connected with all sensors as A0, A1, A2. Automatic and manual mode of selection is connected via SPDT switch to pin A5 and A6.

We can use any WI-FI modem like SIM300, SIM800A, SIM900A, A6, SIM95. Here we have used GSM modem is connected to the TXd (PIN1) and RXd(PIN0) pins of arduino board (PIN0 and PIN1) .LCD data pins (AD4 to AD7) is connected to the pin 10, pin 11, pin12, pin 13 to send the data for the LCD display. The control pins of LCD display is connected to pin 8, pin 9, respectively take action as RS, E. Variable resistor of 10K (or fixed 2.2K) is connected to the adjust contrast of 16X2 LCD display. 10uf capacitor is used to cancel loading effect and 0.1uf is used to bypass the unwanted spikes produced in the circuit.According to programming conditions, in arduino program we can change mobile number and time duration also to control SMS time duration.

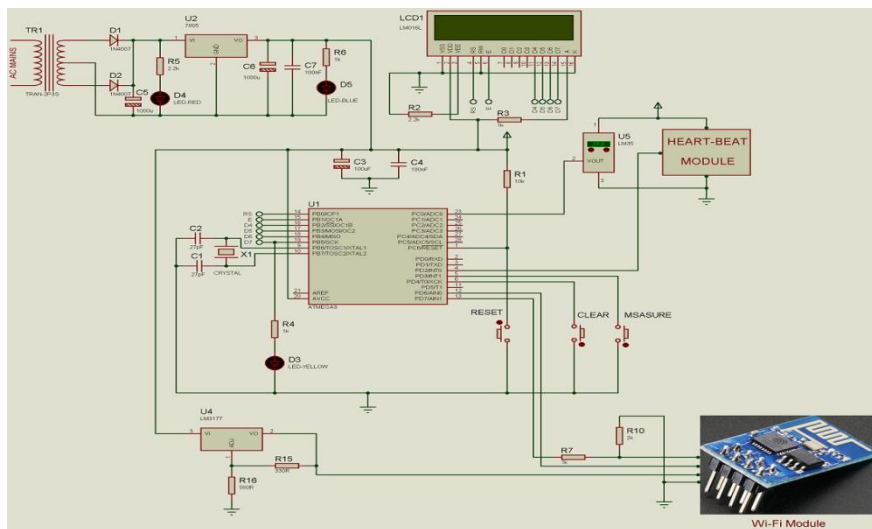


Fig3. Circuit Diagram Of Patient Health Monitoring System Using WI-FI Module

VII. ADVANTAGES AND APPLICATION

ADVANTAGES:

- The circuit required power supply is very less. (12V, 750mAh)
- The component required for this hard ware is easily available in market, and well in rate.
- The circuit works with wide range of sensing ability can be set by preset.
- The circuit works with real-time application also for forming the regular use/ medical instruments.
- Due to serial communication data/ communication is very faster.



APPLICATIONS:

- Main application of this circuit is to measure heart beat and temperature of human body.
- It can be used in industries to monitor the physical conditions/ climate monitoring by implementing few hardware.
- This circuit can also used physical parameter measuring instruments.

VIII. RESULT

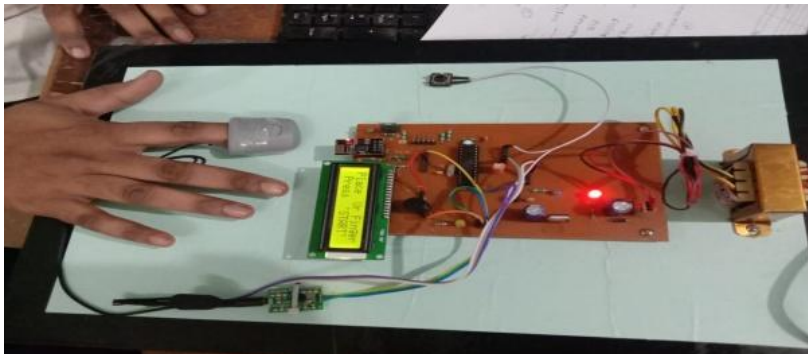


Fig. 4 Patient health monitoring system using WI-FI module

VIII. CONCLUSION

Thus our group actively coupled with project, and we develop this project named as “PATIENT HEALTH MONITORING SYSTEM”. our group actively coupled with project, and we develop this project named as “PATIENT HEALTH MONITORING SYSTEM USING WI-FI MODULE”. System can measure human body temperature by placing in fingers and heartbeat with placing finger tip on H.B sensor module the system can calculate temperature and heart beat and send SMS to the stored mobile numbers in the system.

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