REAL TIME HEALTH MONITORING SYSTEM AND ALARMING USING WIRELESS SENSOR NETWORK

[1]G Sindhura Bhargavi, [2]D Sreelakshmi, [3]J Sunil Kumar

[1]Assistant professor, [2]Assosiate professor, [3]Assosiate professor
[1]Electronics & Communication Engineering
[1]Narayana Engineering College, [1]Nellore, [1]Andhra Pradesh, [1]India

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ABSTRACT

The objective this design and realization of real-timemonitoring and alarming system wireless sensors for patient health, especially for patients suffering withdiseases during their normal life. The system has an embedded microcontrollerconnected to a set of medical equipment and a wirelesscommunication module. Each patient is considered as a node in a wireless sensornetwork and connected to central node installed at the medical center through an internetconnection.If the analysis results are abnormal, the embeddedunit uses the patient& phone to transmit these signals directly to the medical center. Inthis case, the doctor will send medical advice to the patient to save his/her life. Theimplemented prototype has been tested and calibrated with standard devices.

Keywords: Microcontroller**,** Medical equipment**,** wireless communication module, Sensors, ArdinoIDE

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1 INTRODUCTION

Health is one of the global challenges for human being [1]. According to the constitutions of World Health Organization (WHO) the highest attainable standard of health is a fundamental right for an individual [2]. Modernized health care systems provide you good health care services at any place at anywhere and treats as a friend. Now a days, the health care system is undergoing a cultural shift from a traditional approach to a monitored the patient centered approach. The need for a real time recording of vital signs of a patient is done by encapsulating the modern bio instrumentation, computers and telecommunication technologies a modern PMS s hould acquire, record, display, and transmit the physiological data from the patient body to a remote location at any time.

2 RELATED WORKS

This system is mainly used to monitor the health condition automatically.Any one condition abnormal sending Message through GSM to Personal Doctor. All the information is send to internet through IOT. Real time mobile healthcare system for monitoring the patient's condition.
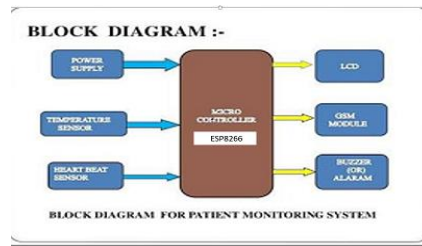
3 HARDWARE USED:

- ❖ Node MCU
- ❖ Pulse sensor
- ❖ Temperature Sensor
- ❖ Vibration sensor
- ❖ Power Supply
- ❖ Alarm

Software used for this project

- ➢ Ardino IDE
- ➢ Blynk App

Block diagram

4 NODE MCU

NodeMCU is an open source LUA based firmware developed for ESP8266 wifi chip. By exploring functionality with ESP8266 chip, NodeMCU firmware comes with ESP8266 Development board/kit i.e. NodeMCU Development board. NodeMCU is an open source LUA based firmware developed for ESP8266 wifi chip. By exploring functionality with ESP8266 chip, NodeMCU firmware comes with ESP8266 Development board/kit i.e. NodeMCU Development board.
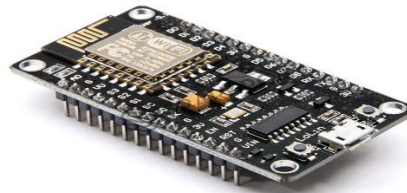

Fig: ESP8266-12E

5 DS18B20 Temperature Sensor

The DS18B20 provides 9 to 12-bit (configurable) temperature which indicate the temperature of the device. Information is sent to/from the DS18B20 over a 1-Wire interface, so that only one wire (and ground) needs to be connected from a central microprocessor to a DS18B20.
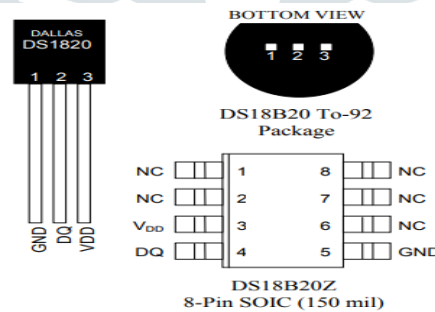
Pin Assignment:

Fig: DS18B20 Temperature Sensor

6 Pulse Sensor

Pulse Sensor is a well-designed plug-and-play heart-rate sensor for Arduino. mobile developers who wantto easily incorporate live heart rate data into The sensor clips onto a fingertip or earlobe and plugs right into Arduino.
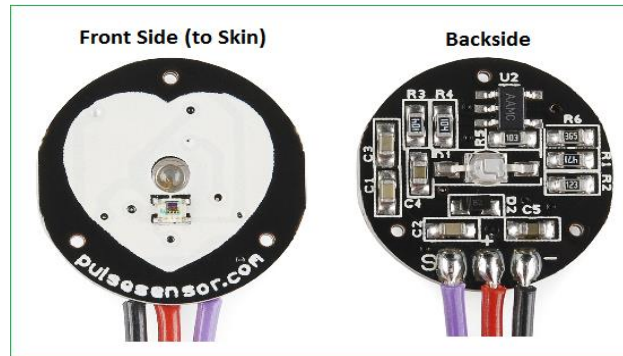
Fig: pulse sensor Front and Back Sides

The Pulse Sensor Kit includes:
          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.
You'll find these Velcro dots very useful if you want to make a Velcro (or fabric) strap to wrap around a fingertip.

7 Vibration Sensor
          Vibration sensoroffer voltage mode accelerometers in the traditional 3-wire or 2-wire (IEPE) configurations. Charge-mode measure shock and vibration in high temperature environments. The Minisense 100 from Measurement Specialties is a low-cost cantilever-type vibration sensor loaded by a mass to offer high sensitivity at low frequencies.
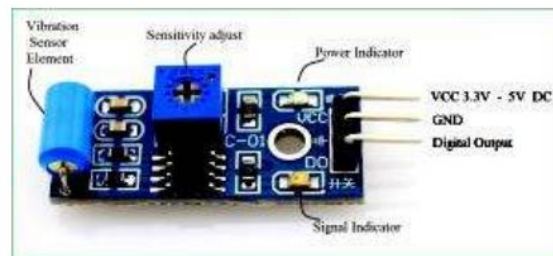The author's prototype is shown in Fig.

Fig: Vibration Sensor

          It is connected to Vcc through a resistor and the thin pin is connected to the circuit to be triggered.It is highly reliable and its response time is less than 2ms. It works more than 500,000 times without breakdown.

8 GPS Module:
          Global Positioning System is a satellite-based module which is used to measure the location on the earth. GPS is also called as Navigation system with time ranging gps. At any given time, there are at least 24 active satellites orbiting over 12,000 miles above earth. It is used to track the mobile devices and by the number of satellites.The satellites are located on the sky above your location will always almost contain 24 satellites in the sky for gpssystem.It has the radio frequency range of 1.1 to 1.5 Hz.
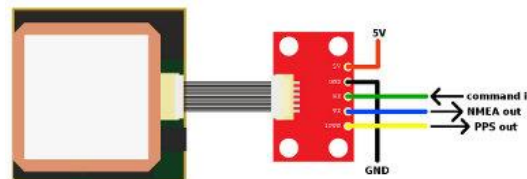
ALARM
          An alarm is a device or system of alarm devices gives an sound or indication, visual or other form of notification about a problem or condition. Alarm devices are often outfitted with a siren.

9 Arduino Installation:
          Arduino is an open source platform based on simple input/output board and it implements the processing language. Arduino used to develop standalone objects.Firstly,arduino ide have to set up on our computer and then we have to upload our program on board via USBcable. We have to select the software which is compatible to our operating system (such as windows,ios,linux)

To create a new project, select file-new
To open existing project select file->example->basics->blink

Fig: USB Printer

Download Arduino IDE Software.

Fig: Arduino IDE toolbar

10 Blynk Cloud

Blynk was especially for the Internet of Things. The hardware can be controlled remotely, it can display sensor data, it can store data, visualize it. Blynk is a platform with iOS and Android apps to control Arduino, Raspberry Pi and the likes over the Internet. Blynk server is responsible for all communication between software and hardware. When we press the button in blynk app the message travels to the blynk cloud.
Its open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.Features:
History data monitoring via History Graph widget, Device-to-Device communication using Bridge Widget,Sending emails, tweets, pushnotificationsetc.
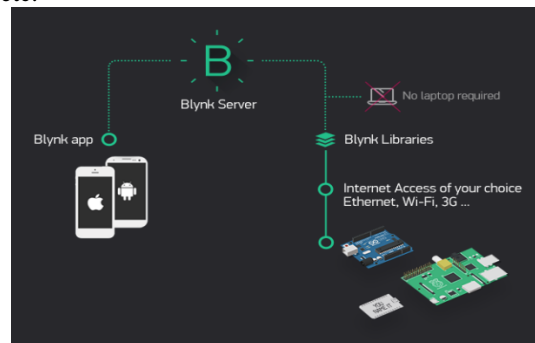
11 CONCLUSION AND FUTURE SCOPE

We can conclude that,the health montoring can be usedmainly for
1. Post operative patients in the hospital 2.elderly patients inHome
3.patients effected by copd and pd in ambulances
This health monitoring using wireless networks can be used formonitoring for different groups of patients health status

In study we can say that,health monitoring of post operative patients inhospitals used to enhance the patient care by integratingsmall sensors.

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