REAL TIME HEALTH MONITORING SYSTEM AND ALARMING USING WIRELESS SENSOR NETWORK

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ABSTRACT

The objective this design and realization of real-time monitoring and alarming system wireless sensors for patient health, especially for patients suffering with diseases during their normal life. The system has an embedded microcontroller connected to a set of medical equipment and a wireless communication module. Each patient is considered as a node in a wireless sensor network and connected to central node installed at the medical center through an internet connection. If the analysis results are abnormal, the embedded unit uses the patient’s phone to transmit these signals directly to the medical center. In this case, the doctor will send medical advice to the patient to save his/her life. The implemented prototype has been tested and calibrated with standard devices.

Keywords: Microcontroller, Medical equipment, wireless communication module, Sensors, Arduino IDE

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 should 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

- Arduino 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.

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:

6 Pulse Sensor

Pulse Sensor is a well-designed plug-and-play heart-rate sensor for Arduino. mobile developers who want to easily incorporate live heart rate data into The sensor clips onto a fingertip or earlobe and plugs right into Arduino.
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 sensor offer 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.

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 USB cable. 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, pushnotifications etc.

11 CONCLUSION AND FUTURE SCOPE

We can conclude that, the health monitoring can be used mainly for
1. Post operative patients in the hospital
2. Elderly patients in Home
3. Patients effected by COPD and PD in ambulances

This health monitoring using wireless networks can be used for monitoring different groups of patients health status.

In study we can say that, health monitoring of post operative patients in hospitals used to enhance the patient care by integrating small sensors.
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