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IOT BASED HEALTH MONITORING SYSTEM

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Abstract

Smart health surveillance technology has attracted wide attention between patients and professionals or specialists to provide early detection of critical abnormal situations without the need to be in direct contact with the patient. This System is a secure smart monitoring portable multivital signal system based on Internet-of-Things technology. The implemented system is designed to measure the key health parameters: heart rate and body temperature simultaneously. Continuous Monitoring of patient's vital signals cannot be provided outside hospital. As it is hard to monitor the patient's condition for 24 hours, it was proposed in this paper to observe continuously the condition of patient despite the patient being busy with his routine and to screen the health status to the doctors through Internet of Things.

Keywords: Internet of Things (IoT), health monitoring, Non-invasive sensors, ThingSpeak, Arduino UNO.

INTRODUCTION

This project presents a proposed project which uses temperature sensor and pulse rate sensor to measure temperature and pulse rate, which is an important parameter for a patient so that the doctor will monitor and can take immediate actions without delay if he finds any abnormality in the patient's heart beat and temperature. In the proposed system, the node from the temperature sensors and heart beat sensors are attached to the patient's body that finds the temperature and heartbeat of the patient and is fed to the microcontroller. The microcontroller used is Arduino UNO. The Arduino UNO processes the data and the data is stored on database. These data are stored in the database. The doctor can access these data from the other side. IoT is implemented to share these health information's with the doctor. IoT is the interconnecting of devices and services that reduces human intervention to give a précised and better life. The project aims to develop a wearable health monitoring system that tracks the user's location, monitors the user's heart rate and body temperature, and visualizes the data in real-time. Authorized users will have access to the collected data stored in the database to keep track of the patient's health data. The system is capable of sending alert notifications to phones and emails when the person wearing the health system is having abnormal body temperature or sudden changes in heart rate. Thus, the objectives of the project are to propose an Internet of Things (IoT) based health monitoring system that collects and monitors the user's body temperature and heart rate in real-time. To propose a system that visualizes and stores the health data in the database while tracking the location of the user by using geolocation.

RELATED WORK

1. EXISTING METHOD:

The Existing model receive the information from physiological parameter in the human body (e.g., heartbeat, Body temperature) and send the information to display unit.

2. PROPOSED METHOD

The IOT based smart health monitoring system is a system that utilizes Internet of Things (IoT) technology to monitor and track an individual's health.

It uses wearable devices, sensors and other connected devices to collect and transmit data about various health parameters such as heart rate, blood oxygen saturation, temperature, etc. The data is

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analysed and processed using algorithms to provide real-time health information to the user, healthcare providers, and caregivers. The system can also provide alerts and notifications in case of any emergencies or deviations from normal health conditions. This system helps to improve health outcomes, increase efficiency in the healthcare system, and provide a cost-effective solution for remote health monitoring.

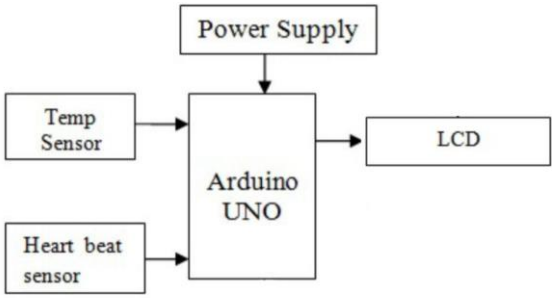

Fig.1: Existing Model

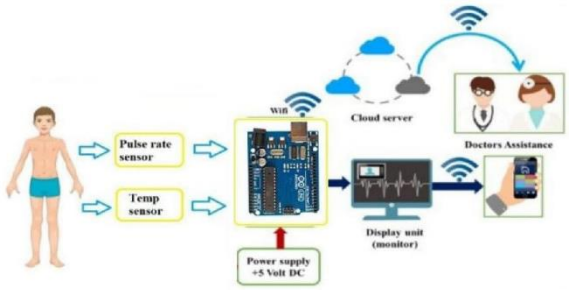

Fig.2: Block diagram of Health Monitoring System

3. COMPONENTS

3.1 Arduino UNO

Fig.3: Arduino UNO

Arduino is an open-source physical computing platform based on a simple input/output (I/O) board and a development environment that implements the processing language. Arduino can be used to develop standalone interactive objects or can be connected to software on your computer. Arduino hardware is an open-source circuit board with a microprocessor and input/output (I/O) pins for communication and controlling physical objects (LED, buttons, etc.,). The board will typically be powered via USB or an external power supply which in turn allows it to power other hardware and sensors.

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3.2 16X2 LCD Display

Display unit is used as conversion between the analog information into the digital information. In Health monitoring system the display unit provide the information received from the Arduino UNO.

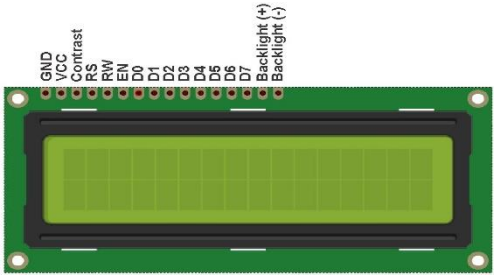

Fig.4: 16X2 Display

3.3 Pulse Sensor

The Pulse Sensor is a plug-and-play heart-rate sensor for Arduino. The pulse sensor has three pins: VCC, GND & Analog Pin. There is also a LED in the center of this sensor module which helps in detecting the heartbeat. Below the LED, there is a noise elimination circuitry that is supposed to keep away the noise from affecting the readings.

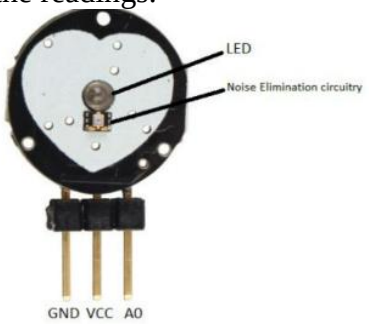

Fig.5: Pulse Sensor

3.4 Temperature Sensor

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies of ±¼°C at room temperature and ±¾°C over a full −55°C to 150°C temperature range**.**

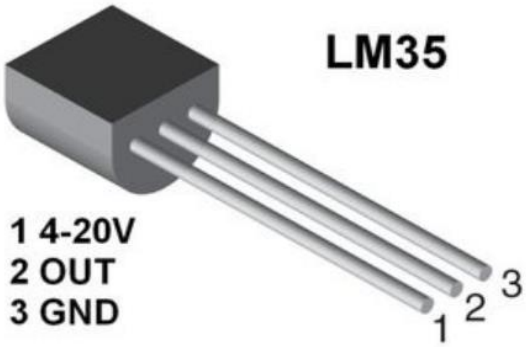

Fig.6: Temperature Sensor

3.5 Power Supply

A linear power supply is a type of power supply that provides a stable, regulated voltage output. For an Arduino, a linear power supply is recommended if you want a stable and noise-free power source to avoid any potential interference with the microcontroller's operation. A 9V linear power supply that provides at least 1A of current is suitable for most Arduino boards.

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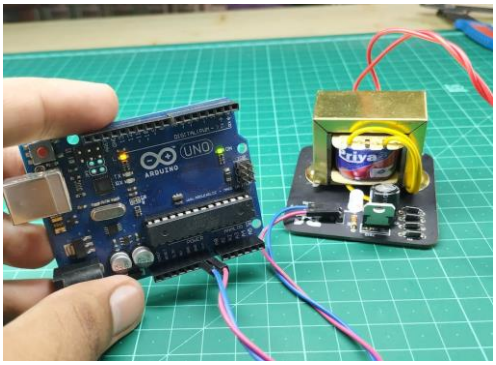

Fig.7: Power Supply

4. Result:

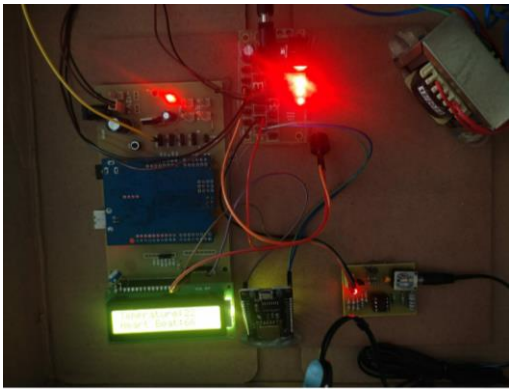

Fig.8: Output Measurements in LCD and Emergency buzzer alarm on Embedded kit

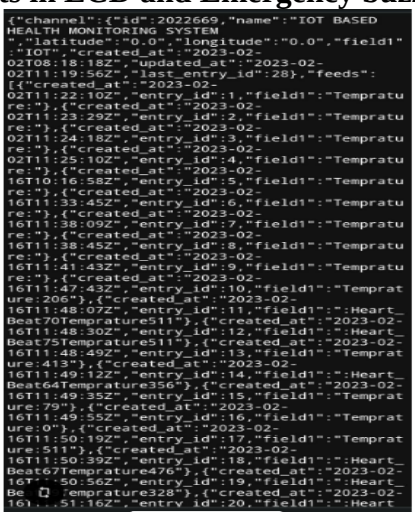
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Fig.9:Notifications in ThingSpeak

5. CONCLUSION:

In this paper, a new method was suggested to improve the detection and monitoring of Health Previously, the sensors that utilized for observing the patient's status are not such an exact, but rather here the sensors we utilized are essentially precise and appropriate for ongoing checking intelligently. So here utilizing Thing**S**peak named new android application and new open-source cloud, the doctor can screen the patient's condition 24*7 and any abrupt changes in patient's status is notified to the doctor. Thing**S**peak server, the patient's condition can be checked remotely from anyplace on the planet. Aside from simply seeing the previous information of a patient, we can utilize this information and curing the patient's health by respective experts.

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