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FINGERPRINT BASED MEDICAL INFORMATION SYSTEM USING IoT

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ABSTRACT

Fingerprint Based Medical System introduces the efficient way to store patient's clinical records. It is used to determine the patient's past health record quickly and easily by using the fingerprint recognition technology. The medical information system which will enable a reliable electronic medical record system stored in the database. Fingerprint Based Medical System introduces the efficient way to store patient's clinical records. It is used to determine the patient's past health record quickly and easily by using the fingerprint recognition technology. The medical information system which will enable a reliable electronic medical record system stored in the database.

KEYWORDS:
Medical System, IoT, Fingerprint, Embedded System

INTRODUCTION

A wireless sensor network (WSN) is a computer network consisting of spatially distributed autonomous devices using sensors to cooperatively monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants, at different locations. The development of wireless sensor networks was originally motivated by military applications such as battlefield surveillance. However, wireless sensor networks are now used in many civilian application areas, including environment and habitat monitoring, healthcare applications, home automation, and traffic control. In addition to one or more sensors, each node in a sensor network is typically equipped with a radio transceiver or other wireless communications device, a small microcontroller, and an energy source, usually a battery. The size a single sensor node can vary from shoebox-sized nodes down to devices the size of grain of dust. The cost of sensor nodes is similarly variable, ranging from hundreds of dollars to a few cents, depending on the size of the sensor network and the complexity required of individual sensor nodes. Size and cost constraints on sensor nodes result in corresponding constraints on resources such as energy, memory, computational speed and bandwidth. In computer science, wireless sensor networks are an active research area with numerous workshops and conferences arranged each year.

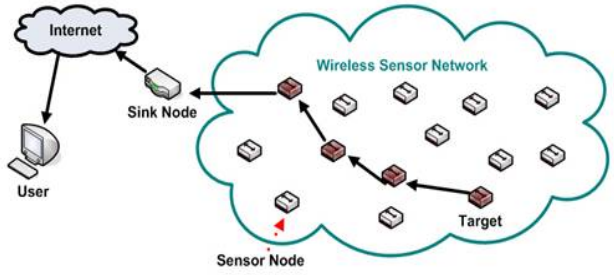

Fig.1 Wireless Sensor Network

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EXPLAINATION OF IoT

This system replaces the conventional paper-based medical records with electronic medical record system. This system also takes the current health details of the patients like temperature, respiratory rate and heart beat rate. By considering the past and present medical data of the emergency people, this system recommends the type of first aid to be given on emergency place like accident occurrence place or ambulance. In proposed system, the finger print is used for medical data retrieval option to avoid the ID tag card missing problem. This system also takes the current health details of the patients like temperature, respiratory rate and heart beat rate live update on IOT portal. The doctor can easily suggest or give the types of aid to be given on that spot.

METHODOLOGY

A heart rate monitor is a personal monitoring device that allows one to measure his or her heart rate in real time or record the heart rate for later study. It is largely used by performers of various types of physical exercise. Heart beat sensor is designed to give digital output of heat beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the beats per minute (BPM) rate.

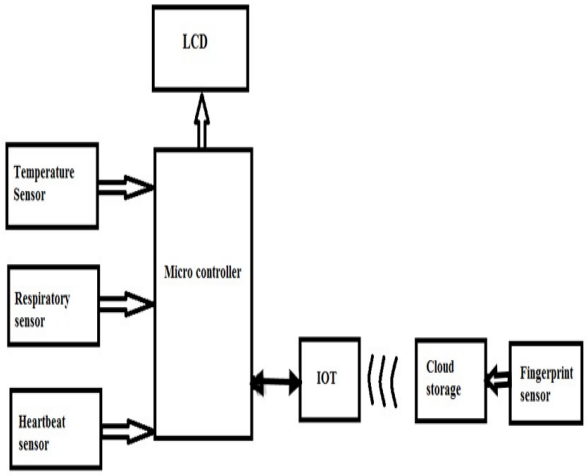

Fig.2 Block Diagram of Proposed System

(Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup.

EXISTING SYSYTEM

Existing system is using Body sensor Network based on IOT but it's only for monitoring the health condition of the patient under observation or the patient in the hospital to maintain their medical data bases. Networked sensors, either worn on the body or embedded in our living environment. It is not only for personal healthcare, nowadays it is also employed for fitness and activity awareness. There is a unit called "body sensor network" which consists of biosensors as per the particular patient's need and health condition. Body sensor Network allows communication between a wearable devices and coordinator. The LPU detects any abnormalities then it provides immediate alert to the person that wearing the bio-sensors and also alert family members or local Physician. But this system monitors only the patient who is in observation and hospital. This system also takes the current health details of the patients like temperature, respiratory rate and heart beat rate by considering the past and present medical data

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of the emergency people, this system recommends the type of first aid to be given on emergency place like accident occurrence place or ambulance.

PROPOSED SYSTEM

In the proposed system, the GSM technology is replace with IoT. The IoT technology monitors the patient health and logs the data in cloud storage. Whenever the patient need emergency care, the proposed system alerts the predefined users and also it finds the nearby emergency contacts like ambulance. The IoT technology uses internet to transfer the medical data about the patient continuously. Body Sensor Network (BSN) allows the integration of intelligent, miniaturized low-power sensor nodes in, on or around human body to monitor body functions and the surrounding environment. It has great potential to revolutionize the future of healthcare technology and attained a number of researchers both from the academia and industry in the past few years. Generally, BSN consists of in-body and on-body sensor networks. An in-body sensor network allows communication between invasive/implanted devices and base station. On the other hand, an on-body sensor net work allows communication between non-invasive/wearable devices and a coordinator. Now, our BSN-Care BSN architecture composed of wearable and implantable sensors. Each sensor node is integrated with bio-sensors such as Electrocardiogram (ECG), Blood Pressure (BP), etc.

IMPLEMENTATION OF ARDUINO

In this the system collects patient's information with the help of sensors. In this design we are monitoring Blood pressure, heart beat and DHT 11 module electrically connected to the system and physically to be worn by the user. On the press of button, the sensor senses the pressure in systolic and diastolic along with the heart beat and sends it to the Arduino. The Temperature sensor senses the temperature of its ambience, so when this sensor is in close proximity of the user it reports the users' body temperature. An LCD is used to display these parameters. If system detects any abrupt changes in patient heartbeat or blood pressure, the system automatically alerts the user and the doctor about the patient's status over IoT and also shows details of heartbeat, temperature, humidity and blood pressure of patient live over the internet. The doctor can get access to these vital parameters pertaining to the patients' health over the Things peak web interface from anywhere over the world. Thus IOT based patient health tracking system effectively uses internet to monitor patient health status and save lives on time. In this way IOT based Patient Monitoring System is an enhanced system that helps in monitoring patients without any manual intervention. The inputs to the Arduino are values from the sensor readings. The Raspberry Pi and the Arduino are serially

HARDWARE COMPONENTS

TEMPERATURE SENSOR LM35

LM35 is precession Integrated circuit Temperature sensor, whose output voltage varies, based on the temperature around it. It is a small and cheap IC which can be used to measure temperature anywhere between -55°C to 150°C. There will be rise of 0.01V (10mV) for every degree Celsius rise in temperature. LM35 is a temperature measuring device having an analog output voltage proportional to the temperature. It provides output voltage in Centigrade (Celsius). It does not require any external calibration circuitry.

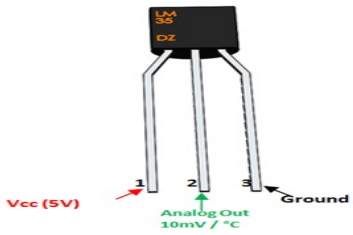

Fig.3 Temperature Sensor

POWER SUPPLY

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The power supply is provided DC motor and microcontroller. The DC power supply with both positive and negative output voltages, a centre-tapped transformer is used and Arduino operates at low power. A relay is an electrically operated switch. Where many relays are used to an electromagnet to mechanically operate a switch/, but other operating principles are also used, such as solid state relays .Relays are used where it is necessary to control a circuit by a low-power signal where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers they repeated the signal coming from one circuit and retransmitted it on another circuit

HEART BEAT SENSOR

A heart rate monitor is a personal monitoring device that allows one to measure his or her heart rate in real time or record the heart rate for later study. It is largely used by performers of various types of physical exercise. Heart beat sensor is designed to give digital output of heat beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats per Minute (BPM) rate

FINGERPRINT SENSOR

The fingerprint sensor is one kind of sensor which is used in a fingerprint detection device. These devices are mainly inbuilt in the fingerprint detection module and it is used for computer safety. The main features of this device mainly include accuracy, better performance, robustness Based on exclusive fingerprint biometric technology. Both fingerprint scanner otherwise reader are an extremely safe &suitable device for safety instead of a secret word. Because the password is easy to scan and also it is hard to keep in mind

RESULT

The parameters like temperature ECG all the details can be monitored by the doctor. The IOT based patient monitoring allows storing the sensory data in cloud. Thus, it provides an efficient way to inform, track and store the details of the patient via internet very quickly. You don't need to invest in expensive point-of-sale software or traditionally expensive credit card machines. If you don't sell anything in person, you don't even need to invest in a cash drawer. Transactions can be carried out anywhere, from any device and at any time, as long as you have an internet connection.

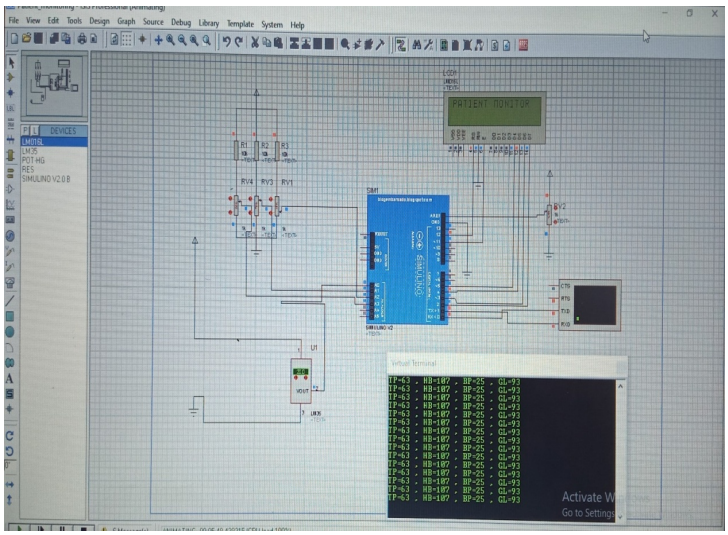

Fig.4 Simulation Output

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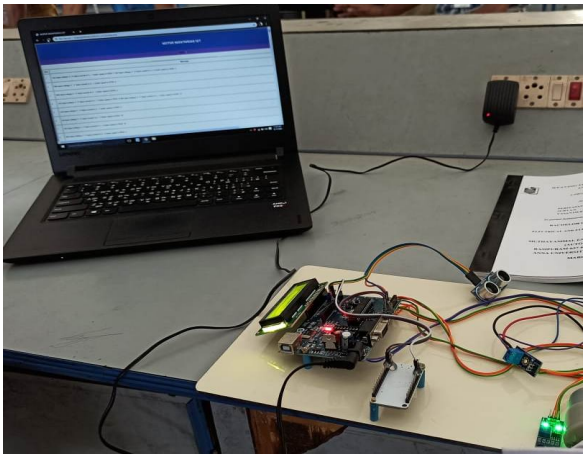

Fig.5 Hardware Output

CONCLUSION

We found that even though most of the popular BSN based research projects acknowledge the issue of the security, but they fail to embed strong security services that could be preserve patient privacy. Finally, we proposed a secure IoT based healthcare system using BSN, called BSN-Care, which can efficiently accomplish various security requirements of the BSN based healthcare system. The entire sensor which is connected in the body is used to collect the abnormal symptoms of the human body and then it is collected back to the doctors through the IOT technology.

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