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IOT BASED PATIENT MONITORING SYSTEM FOR ASTHMA

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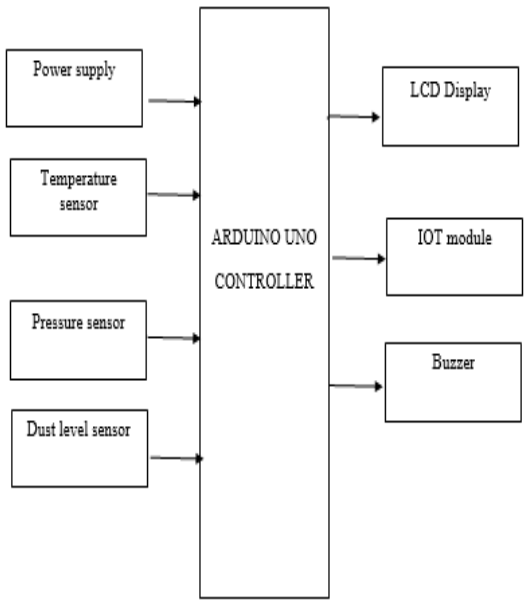
ABSTRACT

In this time of epidemic Healthcare is given extreme importance. IOT based health monitoring is the best solution. In our project a portable physiological checking framework is displayed, which can constantly screen the patients pulse rate, temperature and oxygen. The temperature sensor measures the body temperature and oximeter measures the oxygen level and pulse of the patient when the patient is in contact (fingertip) with the sensors. It is a non-stop measuring instrument which sends data of patient to the IOT server using the Wi-Fi Module. In this system the authorized personal can access these data stored using IoT server and based on these values received, the diseases are diagnosed by the doctors from a distance

INTRODUCTION

Health monitoring is an essential problem in today' s world. Due to lack of proper health monitoring, patient suffer from serious health issues. There are lots of IoT devices that can monitor the health of patient over internet. Health experts are also taking advantage of these smart devices to keep an eye on their patients. With tons of new healthcare technology start-ups, IoT is rapidly revolutionizing the healthcare industry. IOT based patient health monitoring system is a generic term given to any medical equipment that has internet capability and can measure one or more health data of a patient who is connected to the device such as heartbeat, body temperature, blood pressure, ECG, Pulse rate etc. Our device measures temperature, blood oxygen and heart rate. The equipment can record, transmit and alert if there is any abrupt change in the patients health.

BLOCK DIAGRAM



WORKING PRINCIPLE

This system is mainly used to monitor the health condition automatically. In this system, we use the Temperature sensor (DHT11), Pressure sensor and dust level sensor and controller, for monitoring the patient health. Any one Condition Abnormal

sending Message through IOT and buzzer to concern person. All the information is sent to internet through IOT with help of internet to mobile application.

HARDWARE REQUIREMENTS:

- Power Supply
- Arduino Microcontroller
- Pressure sensor
- Dust Level Sensor
- Temperature sensor
- IOT Module
- LCD Display
- Buzzer

SOFTWARE REQUIREMENTS:

- Embedded C
- Arduino IDE
- Proteus testing tool

HARDWARE DESCRIPTION

POWER SUPPLY

The potential transformer will step down the power supply voltage (0-230V) to (0-6V) level. Then the secondary of the potential transformer will be connected to the precision rectifier, which is constructed with the help of op– amp. The advantages of using precision rectifier are it will give peak voltage output as DC, rest of the circuits will give only RMS output.

TEMPERATURE SENSOR

The DHT11 uses just one signal wire to transmit data to the Arduino. Power comes from separate 5V and ground wires. A 10K Ohm pull-up resistor is needed between the signal line and 5V line to make sure the signal level stays high by default

PRESSURE SENSOR: (BMP 180)

The BMP180 consists of a piezo-resistive sensor, an analog to digital converter and a control unit with E2PROM and a serial I2C interface. The BMP180 delivers the uncompensated value of pressure and temperature. The microcontroller sends a start sequence to start a pressure or temperature measurement. After converting time, the result value (pressure or temperature respectively) can be read via the I2C interface.

PRESSURE SENSOR WORKING:

In the net shell it converts the pressure into a small electrical signal that is transmitted and display. They are also commonly called pressure transmitters because of this. Two common signals that are used in a 4 to 20 milli amps signal and a 0 to 5 V signal. Most of the pressure sensor works on the piezoelectric effect. This is when a material creates an electrical charge in responses to stress. The stress is usually pressure but can be twisting, bending or vibration. The pressure sensor detects the pressure and can be used to indirectly measure flow, speed, water level and altitude and can determine the amount of pressure by measuring the electric charge. Pressure sensors needs to be calibrated. It convert the voltage to pressure because for every value of voltage there is pressure value. This is basic zero and spin calibration or minimum and maximum which is common job for maintenance personnel.

DUST LEVEL SENSOR

SM-PWM-01C is a dust sensor that detects the dust particle concentration in air by using optical sensing method. An infrared light emitting diode (IR LED) and a photo-sensor are optically arranged in the device. The photo-sensor detects the reflected IR LED light by dust particles in air.

It works on the principle of Laser Scattering and is especially effective in detecting very fine particles like cigarette smoke, and is commonly used in air purifier systems. This sensor consists of an infrared emitting diode and a phototransistor. It works with a nominal 4.5V to a maximum of 5.5V DC supply voltage

ARDUINO UNO

Arduino Uno is one type of microcontroller board, and it is designed by Arduino.cc. It can be built with a microcontroller like Atmega328. This microcontroller is also used in Arduino UNO. It is a small size board and also flexible with a wide variety of applications. Other Arduino boards mainly include Arduino Mega, Arduino Pro Mini, Arduino UNO, Arduino YUN, Arduino Lilypad, Arduino Leonardo, and Arduino Due. And other development boards are AVR Development Board, PIC Development Board, Raspberry Pi, Intel Edison, MSP430 Launchpad, and ESP32 board

LCD DISPLAY

LCD 16x2 is a 16-pin device that has 2 rows that can accommodate 16 characters each. LCD 16x2 can be used in 4-bit mode or 8-bit mode. It is also possible to create custom characters. It has 8 data lines and 3 control lines that can be used for control purposes.

IOT MODULE

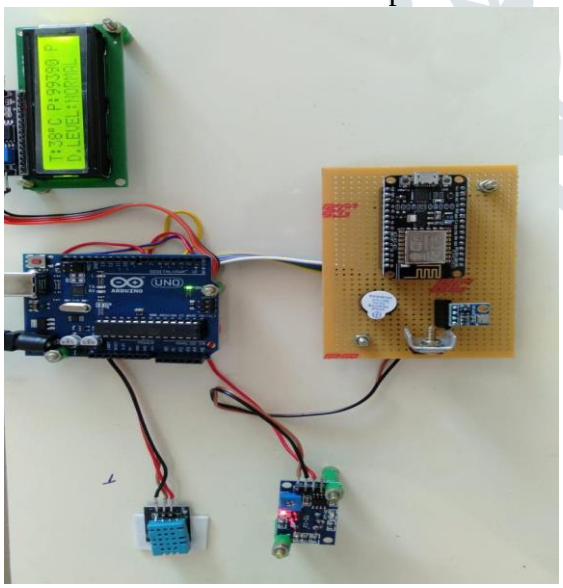
The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

HOW IT WORK

The RX and TX pins of the ESP8266 Module are connected to RX and TX Pins on the Arduino board. Since the ESP8266 SoC cannot tolerate 5V, the RX Pin of Arduino is connected through a level converter consisting of a 1KΩ and a 2.2KΩ Resistor. Finally the GPIO2 pin is connected to an LED to test the working of the program

BUZZER

An arduino buzzer is also called a piezo buzzer. It is basically a tiny speaker that you can connect directly to an Arduino. You can make it sound a tone at a frequency you set. The buzzer produces sound based on reverse of the piezoelectric effect.



CONCLUSION

All over the world, governments, corporations, military establishments and others are using biometric technology for identification objectives. The use of biometrics is rapidly becoming the de-facto means of person authentication in healthcare because there is no other method more safe, secure, affordable, or efficient. Patient safety continues to be one of healthcare' s most pressing challenges, although there are many angles from which patient safety can be addressed, the prevention of duplicate medical records and the elimination of medical identity theft stand out as two of the main culprits jeopardizing the integrity of the healthcare industry. in addition placing patient safety at risk, the root cause of these problems are generally inaccurate patient identification, a problem that can be rectified through the adoption of biometric technology

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