IOT IN HEALTH SECTOR

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ABSTRACT:

Internet of Things (IOT) is one of the technique used to integrate functionality of two or more devices or perform communication between the two devices. We can use the IOT in many areas. In our day to day life we facing health issues. So, we can prevent the health issues with the help of IOT. We can use the IOT into health sector and it is not very expensive. In the research paper, IOT sensors is used to detect our body sensation. ROHM sensor and Arduino shild are used for health detection purpose, so that user can use this device to detect their health condition.

KEYWORDS: Health sector, ROHM, Arduino shild, Arduino Uno, I2C.

1. INTRODUCTION:

Today's life is very fast and people are not getting time to take care of their health. So, in our day to day life we are facing many health issues. The main common issue is heart attack. Many people loss their life due to heart attack. When the flow of blood to the heart is block then heart attack occur. Before heart attack occur we get symptom related to it like pain in our chest, cold sweat, pressure, breathing issue. These issues start occurring before the heart attack occur. Most of the time these issue occur when we take more tension. So, We were not able understand whether it is heart attack or not. Normal heart beat rate is 60 to 100 beats per minute. If we get to know the beat rate of our heart then we will know that our heart beat rate is low or high. According to it we can meet the doctor to take suggestion.

2. RELATED WORK:

Connecting two Arduino:

1) To share the load of one Arduino to another we can connect two Arduino'stogether. So, we can use I2C i.e Inter-Integrated Circuit to perform communication between components of motherboard.

2) Now we will create one master master Arduino and one slave Arduino. So, master Arduino can give command to slave Arduino.

3) To create this circuit we need two Arduino and one Jumper cables. Steps for configuration of two arduinos are as follow.
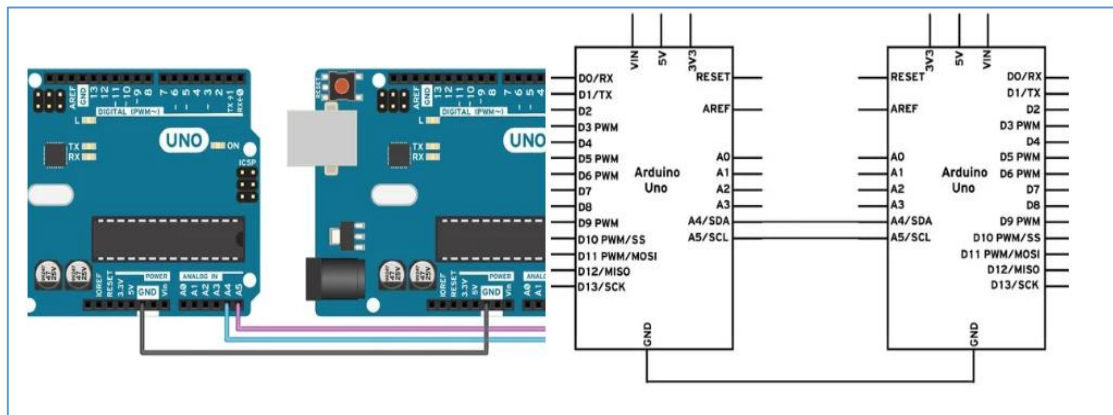
Step:1

Fig.1: Two Arduino Connnection

Connect A4 and A5 pin of one Arduino to another. Then connect GND line of two Arduino with Jumper. Here important instruction is we have to choose the Arduino of same voltage. It should not be of different voltage.

Step 2: Now we have to use two code master code and slave code which will run on two different arduinos. Here we need to add "Wire.h" file into master file and so we use I2C bus using Wire.begin() function. If we are not providing any argument in the function then Arduino will start as a master. For slave we also need the wire.h library file and we can use I2C bus using Wire.begin(9). The 9 is the address we want to use for Arduino. So all devices with address 9 will act as slave Arduino. When we receive the I2C transmission then we use wire.onReceive(receiveEvent) .

Step 3:

I2C requires two digital lines SDA(Serial Data Line) and SCL(Serial Clock Line).SDA is use for data transfer and SCL to keep the clock.I2C connection can have one master and multiple slaves. So, master can write to slave but slave cannot directly write to master or another slave. Each slave has unique address and master communicate with them by the address of slave.

Add WiFi to Arduino UNO:

We can connect arduino to the internet by using ESP8266 WiFi Module. The ESP8266 Wifi module is a used for the purpose of WiFi network where we can easily connect to Wi- Fi adapter by using Serial Communication or UART interface.

What is the process?

We can use ESP866 for the communication. It is used to send/receive data through network. ESP866 act as AP model i.e.Access Point. It is used to connect the other devices to network. So, if we use ESP866 in our phone and send request to Arduino then it will work.

Step 1: Build Circuit

Follow these steps.

1. First connect the red wire to VIN(3.3V) to the +3.3V from the microcontroller.
2. ☐Second connect the black wire to the ground.
3. Thirdconnect the green wire to the TX of the Wifi module and microcontroller
4. Fourthconnect the yellow wire to the RX of the wifi module and microcontroller

About the circuit

ESP8266 support only to 3.3V. If the power is more than 3.3V then will destroy the module. Now, Connect the VIN to 3.3v to power up and also the ENABLE pin to enable the module. TX is connected to RX.So, the data which we want to transmit through ESP8266 will receive by Arduino Uno software and viceversa for RX to TX. Now, we can use WIFI with Arduino UNO.

About the code:

We can create custom code to access the Arduino through wireless network. So, For example if we want to show the heart rate through the sensors the data from the sensors will be sent through wifito the device.

3. EXISTINGSYSTEM

The existing system having limited sensor capacity. So it provide only the limited sensor. If they want to add the new sensor then it will create problem to them, Because it has the limited capacity and it don't have the hardware which support to add other sensor. Also the price of existing system is not affordable to common people. So, each people will not able use the functionality of sensors.

4. PROBLEM DEFINITION

The current system has the limited capacity of sensor. So, if they want to add new sensor they will not able to add sensors on same system. The price of existing system is also high. It is not supporting the wireless connectivity to app. It shows the result on their device screen.

5. PROPOSEDSYSTEM

In the proposed system I used Arduino shield and the ROHM sensors. ROHM sensors has many types. ROHM consist eight sensors like accelerometer, temperature sensor, a heart rate sensor, pressure sensor, a magnetometer, a hall sensor, a colorsensor, optical proximity and ambient light sensor, etc.

The Arduino shield contains eight slots. These eight slots has their own functionality and each slot behaves differently. From the eight slots two slots are analog, one is GPIO and other five I2C. So at a time we test only six sensors work on I2C. The sensor which we want to use, we need to plug them on Arduino shield and we need to pull the example code into one file.

On the IDE, we need to copy the relevant bit of code and we get some tweaks for readability. So, we can upload it and then check the serial monitor. We will get all of the inits and the data. If we use pressure sensor then it has integrated temperature sensor for measure the temperature. So , once we done with plugging the sensor and loading the example code into

the IDE and we can start with the sensor. We can connect our Arduino shield with laptop or wireless mobile. So, Once the configuration is done the we can do the testing. To test our pressure or temperature we can put our figure on sensor, then sensor will give you the pressure on laptop or mobile screen. If we use heart rate sensor then it will show the heart rate with graph. So, it is easy to use and we can configure Arduino easily. We can use this device in our day to day life. It gives correct results. Now a days there are some device are available like Apple Watch. It has great features. But it has great price also. So, we can use a simple configuration, less power devices and less costly device. We can carry the device anywhere an we can use anytime.
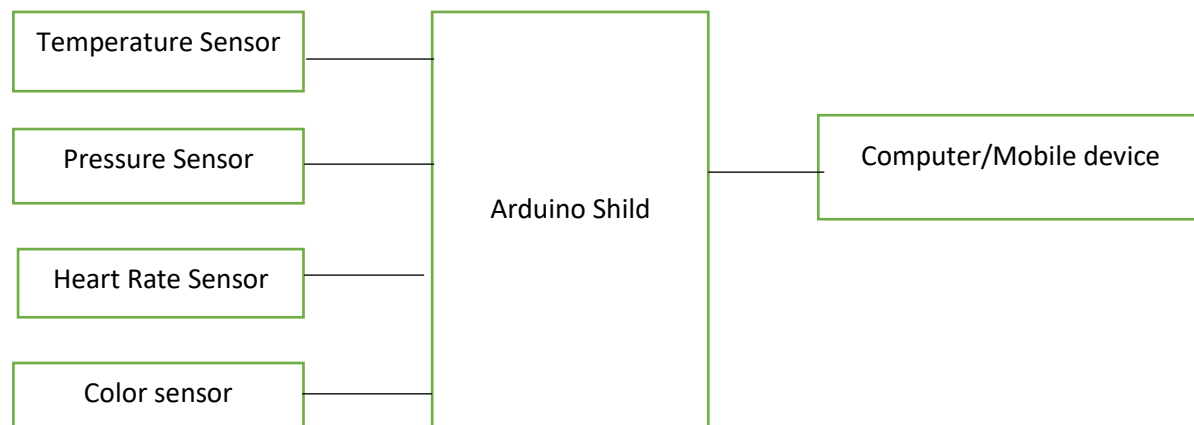
6. ARCHITECTURE

Fig.2: Arduino shild with sensor

The above diagram shows the configuration of sensor with the Arduino shild. We can add number of sensors at a time. We can attach only six sensors at a time. We have number of sensors available into the market. I used only six sensors for health issue detection like accelerometer, temperature sensor, a heart rate sensor, pressure sensor, a magnetometer, a hall sensor, a color sensor,optical proximity and ambient light sensor, etc.

So, we can easily use the sensors with Arduino shild. After the sensor get attached to Arduino shild, we need to attached the Arduino shild on Arduino circuit. Now we need to connect the Arduino circuit to laptop or mobile. Then we need to add the code of each sensor into Arduino. So, the codes of each sensors are available online. Simply we need to add that code into Arduino. To add that code we need to use Arduino Uno software. Once we done with adding the sensor code into Arduino Uno software we can access the sensor easily.

7. ADVANTAGES:

1. Easy to use.
2. We can add as many sensors as we want.
3. It gives correct result.
4. It is less costly.
5. Power required to Arduino is very low.

8. DISADVANTAGE:

1. We cannot use the two Arduino with different voltage.
2. Arduino connection should be proper.
3. Price of Arduino increase according to the number of sensor get increase.

9. CONCLUSION:

By using Arduino for health detection we can add number of sensor as we want and it gives the correct result. The use of this device is also simple, we need to just put finger on sensor,it will sense and gives data on the screen. So, we can call the doctor to take the suggestion and we can save the time. We can use this device when we need to do check our health and we can carry this device where we want.

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