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# Health Monitoring Using IoT and Voice Conversion Using Hand Gesture

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***Abstract:*** *Communication is the only medium by which we can share our thoughts or convey the message but for a person with disability (deaf and dumb) faces difficulty in communication with normal person. The people with hearing and speaking difficulties use sign language to converse with each other. They have difficulties while conversing with people who do not know sign language. We have addressed this issue in our proposed project. So, We uses the mems sensor as an input module, and it was interacted with microcontroller board(MCB) where the output signal of the mems sensor was diagnosed by the MCB which was programmed with set of instructions and that instructions were processed by the MCB and executes the respective output function for the output module of our proposed system the Audio playback recorder module and Speaker, In addition with that we use the temperature sensor to monitor the person's body temperature as for the health monitoring of them.*

***Key Word:*** *Mems sensor, Voice playback module, DTH11 sensor.*

## I.INTRODUCTION

In our life we meet many disable people, some of them are partially and some are completely disabling. The partially impairedpeople like dumb, deaf, paralysis in one leg or hand manages their life with difficulties and feel separate from others. Here communication plays major role to feel someone better and indulging them in an activity where they may say themselves as independent person. By this thought the project Smart Hand Gloves for Disable People is developed so that disable person can livehis life as he wants.

In this project, MEMS Sensor plays the major role. The glove is fitted with mems sensors. The sensors give output in the formof voltage variation that varies with degree of bend. This MEMS sensor output is given to the ADC channels of microcontroller. It processes the signals and perform analog to digital signal conversion. Further the processed data is sent in a wireless manner to thereceiver section.

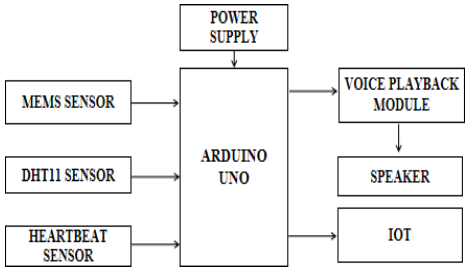
## II.OBJECTIVES AND METHODOLOGY

**Objectives:**

1. Deaf and dumb people are humans at the deepest psychological level. Many of these people are not even exposed to sign languages.
2. It is observed that it gives a great relief on a psychological level, when they find out about signing to connect themselves with others by expressing their love or emotions. About 5% population in world are suffering from hearing loss.
3. Deaf and dumb people use sign language as their primary means to express their thoughts and ideas to the people around them with different hand and body gestures.
4. There are only about 250 certified sign language interpreters in India for a deaf population of around 7 million.
5. In this work, the design of prototype of an assistive device for Deaf-mute people is presented so as to reduce this communication gap with the normal people. This device is portable and can hang over the neck. This device allows the person to communicate withsign hand postures in order to recognize different gestures-based signs.

**Methodology:**

Below diagram **(Figure 1: Block diagram)** gives a glimpse on the end-to-end process carried out during the entire research work.



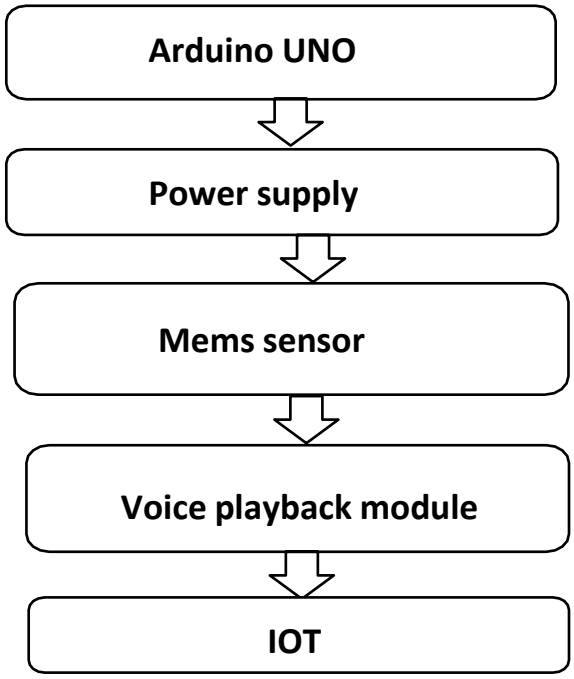
**Experimental Procedure:**

This chapter would give an overview of the experimental procedures followed throughout the entire procedure. Each and every procedure tells us exactly how the procedure was exhibited, giving clear cut idea and detailing every aspect of the procedure carried out. As this is a step-by-step procedure. Each procedure requires certain amount of time and all should in accordance with the flow of happening. Below chart **(Figure 2: Flow Chart)** gives a glimpse of how the process flow happens in overall experimental procedure.

The Sensors are connected to the Arduino UNO (Atmega 328), The output of the sensors are viewed in mobile phone which is connected to the wifi module in the circuit. Using Mems Sensor Range the voices are recorded in the voice playback module. When the Mems Sensor moves then the respective voices will perceive in the Speaker.

## III.PROPOSED SYSTEM

- In this project, we are going to propose a system-prototype in an effort to make the process of interaction between theDeaf and Dumb people with physical disabilities much easier.
- This will make use of the Portable Technology and Arduino controller to provide a means of communication to differently-abled people having one or all of the above mention disabilities.
- Communication accuracy is much better than existing system. This system can be enhanced by using Mems sensors in palm, so that conversation which uses these bent positions can be obtained accurately.
- Here we are using iot module esp8266 module to monitor the entire value.




## IV.HARDWARE AND SOFTWARE COMPONENTS

**Hardware Requirements:**

- Arduino microcontroller
- MEMS Sensor
- Playback module
- Speaker
- Power supply
- Bluetooth
- LCD display
- Dht11

**Software Requirements:**

- Arduino IDE
- Embedded C

This DHT11 Temperature & Humidity Sensor features a temperature & humidity sensor complex with a calibrated digital signal output. By using the exclusive digital-signal- acquisition technique and temperature & humidity sensing technology, it ensures high reliability and excellent long- term stability. The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Heart Beat Sensor **use electrical detection to track your heart rate**. They detect electrical activity through a band that wraps around your chest. For most of these devices to work as designed, the band must be wet, or you need to use a conductive gel where the sensors touch your skin**.** A heartbeat sensor consists of a control circuit and a sensor. The sensor part consists of an IR LED and a photodiode or phototransistor placed in a clip.

Voice Playback Module (APR33A3) provides high quality recording and playback with 11 minutes audio at 8 Khz Sampling rate with 16 bit resolution. The aPR33A series C2.x is specially designed for simple key trigger, user can record and playback the message averagely for 1, 2, 4 or 8 voice message(s) by switch, It is suitable in sple interface or need to limit the length of single message.

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmablecircuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment)that runs on your computer, used to write and upload computer code to the physical board.

Embedded C is most popular programming language in software field for developing electronic gadgets. Each processorused in electronic system is associated with embedded software.

## V.RESULT

This chapter deals with the output as instructions which is helpful for patients, deaf and dumb people and intimate their healthconditions like temperature, ventilation and heartbeat rate to caretakers.

**Code:**

```
#include <Wire.h> #include "DHT.h" #define
DHTPIN 2#define DHTTYPE DHT11 // DHT 11

DHT dht(DHTPIN, DHTTYPE);

#define voice1 3

#define voice2 4

#define voice3 5

#define voice4 6

#define voice5 7

#define SECONDS 15000 unsigned int long Time = 0;int flag = 0;

int count; intvalue;

int ADXL345 = 0x53; // The ADXL345 sensor I2C address floatX_out, Y_out, Z_out; // Outputs
void setup() { Serial.begin(9600); pinMode(3,OUTPUT); pinMode(4,OUTPUT); pinMode(5,OUTPUT);
pinMode(6,OUTPUT); pinMode(7,OUTPUT); Serial.println("DHT11 test!"); dht.begin();

Wire.begin(); // Initiate the Wire library

// Set ADXL345 in measuring mode

Wire.beginTransmission(ADXL345); // Start communicating with the device

Wire.write(0x2D); // Access/ talk to POWER_CTL Register - 0x2D

// Enable measurement

Wire.write(8); // (8dec -> 0000 1000 binary) Bit D3 High for measuring enableWire.endTransmission();

delay(10);

}
void loop() {

delay(2000); // Wait a few seconds between measurements float h =dht.readHumidity();

// Reading temperature or humidity takes about 250 milliseconds! float t =dht.readTemperature();

// Read temperature as Celsius (the default) float f =dht.readTemperature(true);

// Read temperature as Fahrenheit (isFahrenheit = true)
```

```
// Check if any reads failed and exit early (to try again). if (isnan(h) ||isnan(t) || isnan(f) ) {

Serial.println("Failed to read from DHT sensor!"); return;
}
Serial.print ("Humidity: "); Serial.print (h); Serial.print ("
%\n");

Serial.print ("Temperature: ");Serial.print (t);

Serial.print (" *C "); Serial.print (f); Serial.print (" *f "); Serial.print (" %\n");

Time = millis();count = 0;

while (Time + SECONDS > millis()) {value = analogRead(A0);

//Serial.println(value);

//delay(100);

if (value > 300 && flag == 0) {count++;

Serial.print(".");flag = 1;
}
else if (value < 300 && flag == 1) flag = 0;
}
count = count * 4; Serial.print("heart rate= "); Serial.println(count); delay(1000);

if((count>95)||(count<50)){ Serial.println("HEART RATE IS ABNORMAL");
}
else{
Serial. println("HEART RATE IS NORMAL");
}
Wire.beginTransmission (ADXL345);

Wire.write(0x32); // Start with register 0x32 (ACCEL_XOUT_H)Wire.end Transmission(false);

Wire.requestFrom(ADXL345, 6, true); // Read 6 registers total, each axis value is stored in 2 registers X_out = ( Wire.read()|
Wire.read() << 8); // X-axis value
X_out = X_out/256; //For a range of +-2g, we need to divide the raw values by 256, according to the datasheet

Y_out = ( Wire.read()| Wire.read() << 8); // Y-axis value Y_out =Y_out/256;

Z_out = ( Wire.read()| Wire.read() << 8); // Z-axis value Z_out =Z_out/256;

Serial.print("Xa= "); Serial.print(X_out); Serial.print(" Ya= "); Serial.print(Y_out); Serial.print(" Za= ");
Serial.println(Z_out); delay(200);

if(X_out<1 && X_out>0.70){digitalWrite(voice1,LOW); delay(2000);

Serial.println("I NEED MEDICINE");
}
else{ digitalWrite(voice1,HIGH);
}
if(X_out<0.70 && X_out>0.30){digitalWrite(voice2,LOW); delay(2000);
Serial.println("I WANT THIS");
}
else{ digitalWrite(voice2,HIGH);
}
if(Y_out<1  && Y_out>0.70){

digitalWrite(voice3,LOW); delay(2000);Serial.println("I HUNGRY");
}
else{ digitalWrite(voice3,HIGH);
}
if(Y_out<0.70 && Y_out>0.30){
```

```
digitalWrite(voice4,LOW);delay(2000);

Serial.println("WHAT'S YOUR NAME");
}
else{ digitalWrite(voice4,HIGH);
}
if(Z_out<1  && Z_out>0.70){

digitalWrite(voice5,LOW);delay(1000);

Serial.println("I WANT TOPLAY");
}
else{ digitalWrite(voice5,HIGH);
}
if(Z_out<0.70 && Z_out>0.30){

digitalWrite(voice6,LOW);delay(1000);

Serial.println("I AM PREETHI ");
}
else{ digitalWrite(voice6,HIGH);
}
if(X_out>=1 ){

digitalWrite(voice7,LOW);delay(1000);
Serial.println("I AM FROM ERODE");
}
else{ digitalWrite(voice7,HIGH);
}
if(Y_out>=1 ){
digitalWrite(voice8,LOW);delay(1000);


Serial.println("I AM GOOD PERSON YOU KNOW");
}
else{ digitalWrite(voice8,HIGH);
}
delay("_____");
}
```

**Output:**

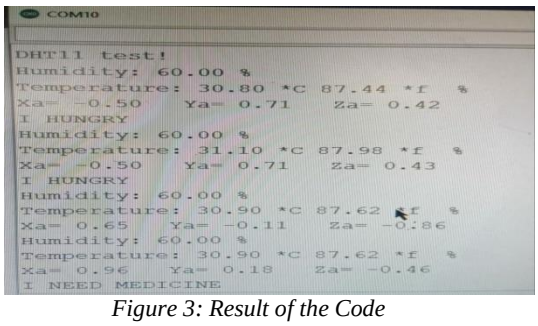



*Figure 3: Result of the Code*

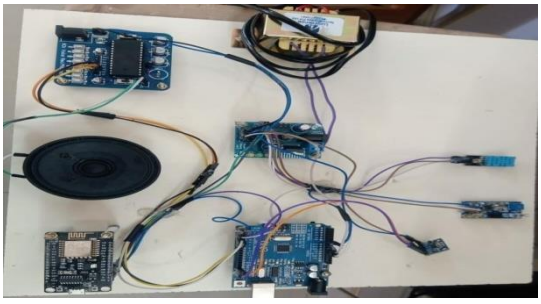


*Figure 4: Hardware Configuration*

## VI.CONCLUSION

This project introduced the Smart Hand Gloves for Disable People. It will provide the more reliable, efficient, easy to use and light weight solution to user as compare to other proposed papers. This will responsible to create meaning to lives of Disable People. During this project we face various types of challenges. We have tried to minimize the problem. One problem is there to make it Wireless. So, we observed and analyzed different research papers and products available in market which are bulky, difficult of handle, and delicate in structure. Since this was a prototype, our focus was to build a model, which can solve orminimize the communication problem for the disable people.

## References


[1] *P. C. Badhe and V. Kulkarni, "Indian sign language translator using gesture recognition algorithm," 2015 IEEE International Conference on Computer Graphics, Vision and Information Security (CGVIS), Bhubaneswar, 2015, pp. 195-200.*

[2] *Madhuri Sharma, Ranjna Pal and Ashok Kumar Sahoo, "Indian Sign Language Recognition Using Neural Networks and KNN Classifiers", ARPN Journal of Engineering and Applied Sciences, Vol. 9, No. 8, August 2014.*

[3] *V. Adithya, P. R. Vinod and U. Gopalakrishnan, "Artificial neural network based method for Indian sign language recognition," Information & Communication Technologies (ICT), 2013 IEEE Conference on, JeJu Island, 2013, pp. 1080-1085.*

[4] *A. Singh, S. Arora, P. Shukla and A. Mittal, "Indian Sign Language gesture classification as single or double handed gestures," 2015 Third International Conference on Image Information Processing (ICIIP), Waknaghat, 2015, pp. 378-381.*

[5] *Gunasekaran. K, Manikandan, International Journal of engineering andtechnology (IJET): Sign language to speech translation using PIC Microcontroller*

[6] *Thomas Prayor and Navid Azodi of university of Washington lemelson- MIT undergraduate Sign Aloud -gloves that transliterate sign language into speech.*

[7] *Pratibha Pandey, Vinay Jain, Hand Gesture Recognition for Sign Language Recognition: A Review, International Journal of Science Engineering and Technology Research (IJSETR), Volume 4, Issue 3, March 2015.*

[8] *Mandeep Kaur Ahuja, Amardeep Singh, Hand Gesture Recognition Using PCA, International Journal of Computer Science Engineering and Technology(IJCSET), Volume 5, Issue 7, pp. 267-27, July 2015.*