GESTURE CONTROLLED SPEAKING MICROCONTROLLER FOR DUMB AND HANDICAPPED PEOPLE USING INTERNET OF THINGS(IOT)

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Abstract - *This paper shows an approach to build a cost-effective system for Dumb and handicapped people using IOT(INTERNET OF THINGS). The most of the task that we carry out in our day -to- day life involves speaking and hearing. There are many handicapped or dumb people in our country who are not able to communicate with the other people easily. Physically disable persons suffered a lots of problem in their life. They must have their own way to communicate with the other people. They always need a support to live their life more accurately and efficiently. Such persons find themselves in awkward situation. Hence, I have taken an initiative to make their life more happy and easier and so I have developed a system called "Gesture controlled speaking microcontroller for dumb and handicapped people using IOT" to help them to live their life as they wish. It will be very helpful for the dumb persons to convey their message to others. Here, we have used 3 - axis accelerometer sensor for getting the data from the dumb people using microcontroller NODE MCU-32s for controlling all operations. APR 9600 voice kit is used for voice recording and playing. LCD display and speaker are used as output device to convey the message to dumb people. So, this device provides an efficient and accurate way of communication for both dumb and normal people.*

Key Words: **IOT, 3- axis Accelerometer, Gesture, microcontroller Node MCU 32's , Speaker.**

1. INTRODUCTION

When a dumb or speechless person speaks to a normal people, the normal people finds it difficult to understand and ask the dumb person to show their hand movements for his/her needs. If some people have met with an accident and are unable to speak or have lost their ability to speak, it becomes difficult for them to convey their thoughts or messages within the society. To overcome this difficulty, I have proposed a smart project called **"Gesture Controlled speaking microcontroller for Dumb and Handicapped people using Internet Of Things(IOT)."** In this project, the user can tilt the ADXL335 a 3- axis accelerometer sensor in 3 different orientations. The specific voice messages are recorded for each different orientations. The glove is fitted with the accelerometer sensor. This sensor output is given to the ADC channels of microcontroller(NODE MCU 32-s). The signal is proceed and perform analog to digital signal conversion. The gesture movement is identified and the corresponding output is displayed on LCD and displayed output is play

backed through speaker. Simultaneously, at the same time, the data will be displayed on the thingspeak(IOT).You can change the voice messages at any time according to one's need without modifying the program code. The major advantage of this project is that it is easy to carry out anywhere. Thus, with the help of this project, the difficulty faced by the people in communicating with the society or normal person can be reduced to a greater extent.

2. BLOCK DIAGRAM OF PROPOSED SYSTEM
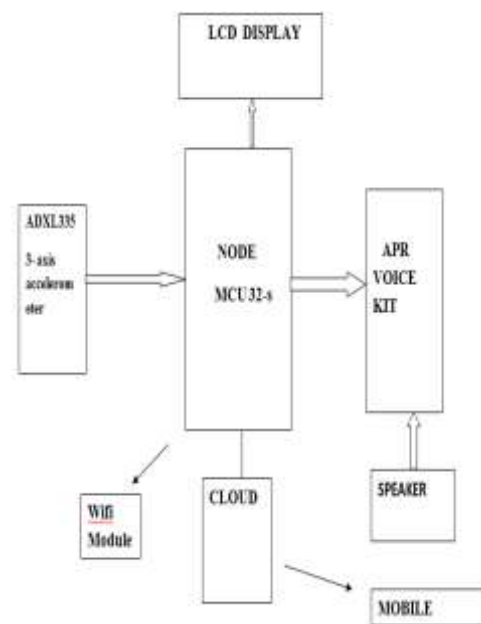
Figure 1: Block diagram of gesture Controlled speaking microcontroller for Dumb and Handicapped people

For proposed system we required the following components:

2.1 Components

The hardware requirements are:
1. NODE MCU 32-s
2. Data cable
3. Speaker
4. ADXL335 3-axis accelerometer
5. APR Voice Kit
6. LCD Display

The software requirement is :
1. Arduino

2.2 Description of the Proposed System:

In this proposed system, we have used a hand glove which has to be worn by the dumb and handicapped people. This glove is mounted with ADXL335 3-axis accelerometer sensor .The output from the sensor is given to the Analog to Digital channels of the microcontroller.

The processed Analog to Digital channel values from the microcontroller are recognized by a particular gesture. The particular gesture is recognized & is given to the microcontroller which transmits the data in a serial manner.

For each value received , the microcontroller gives corresponding commands to the LCD and the Voice recorder module (APR VOICE KIT). Thus, we get the output in the form of voice for each gesture and also the output is displayed in the form of text on the LCD .On thingspeak, we see the similar output in the form of waveform.

2.3 Project kit for Gesture Controlled speaking microcontroller for Dumb and Handicapped people using Internet Of Things(IOT)

Figure 2: Gesture Controlled speaking microcontroller for Dumb and Handicapped people using IOT

3. OUTPUT

1)When we keep our hand at a flat position, the serial monitor will display Wi-fi connected, IP address ,stop and some range of values at which the system will be at the stop position. On LCD , it will display the name "Gesture Control". This is shown in the below figure 3.1,figure 3.2,figure 3.3.

Figure 3.1: "When we tilt our hand at flat position"

Figure 3.2: "Wi- fi connection displayed on serial monitor"

Figure 3.3: LCD display "Gesture Control".

2)When we tilt our hand at right position, it will play the voice "Please take me to the Doctor" and the same voice will be displayed on the LCD. Later, the same output will be displayed on the thingspeak(IOT) in the form of waveform. This is shown in the below figure 3.4,figure 3.5,figure 3.6,figure 3.7.

Figure 3.4: "When we tilt our hand at right position"

Figure 3.5: Display the range of values on serial monitor when we tilt our hand at right position

Figure 3.6: Display "Please take me to the Doctor"

Figure 3.7: Data displayed on IOT platform when we tilt our hand at right position

3)When we tilt our hand at left position, it will play the voice "Please something to eat" and the same voice will be displayed on the LCD. Later, the same output will be displayed on the thingspeak(IOT) in the form of waveform. This is shown in the below figure3.8,figure 3.9,figure 3.10.

Figure 3.8: Display the range of values on serial monitor when we tilt our hand at left position

Figure 3.9: Display "Please something 2 eat"

Figure 3.10 : Data displayed on IOT platform when we tilt our hand at right position

4. CONCLUSION

This paper describes that the above design system is useful for dumb and handicapped people to communicate with the society and with the normal person .The dumb people do actions of hand which is not easily understandable by the common people. This system converts the movements of hand into voice which can be easily understand by the

common people. The gesture movement is translated into the form of voice and text , so that dumb people can convey their thoughts and messages to the other people in the society. This text is displayed on LCD and voice is played back through the speaker by which the other person can understand. In this way, our project is very well useful for dumb people and can also be used for other applications like Biometrics. The main purpose of building this project is that one can carry the system anywhere as per ones requirement.

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