

Hand Gesture Recognition and Speech Conversion

Snehal Santosh Jagtap¹, Ashwini Sunil Jadhav¹, Girija Santosh kadekar¹, Prof. Vyavhare V. A², Prof. Divekar S. N.³

¹Department of E&TC, Parikrama college of Engg. Kashti, Ahmednagar, Maharashtra, India

²Assistant Professor Department of E&TC, Parikrama college of Engineering, Kashti, Ahmednagar, Maharashtra, India

³HOD Department of E&TC, Parikrama college of Engineering, Kashti, Ahmednagar, Maharashtra, India

ABSTRACT

Article Info

Volume 8, Issue 3

Page Number: 488-490

Publication Issue :

May-June-2021

Article History

Accepted : 12 June 2021

Published: 21 June 2021

In this paper, hand gesture recognition and speech conversion has a special features and which makes deal with principal and authority person of university to inform that the hand gesture recognition and speech conversion is developed by using Arduino uno and flex sensor. Using the flex sensor gesture made by the wearer is detected and then according to various pre-defined conditions for the numerous value generated by the flex sensor. Then the corresponding recording will be played using voice playback IC.

Keywords : Flex sensor, Arduino Uno, voice module.

I. INTRODUCTION

In our country around 2.78 percent of people are not able to speak. Generally deaf dumb people use sign language for communication, but they find difficulty in communicating with others who don't understand sign language. Due to which communication between deaf-mute and a normal person have always been challenging task. We propose to develop a device which can convert the hand gesture of a deaf-mute person into speech. This device is very useful for them for conveying their thoughts to others. This methodology provides a map for developing a digital wireless glove which is fitted with flex sensors. This sensor sense the gesture of a in the form of bend of fingers and tilt of the hand fist. This system includes a voice playback IC to give the real time speech output in regional language.

II. PROPOSED SYSTEM

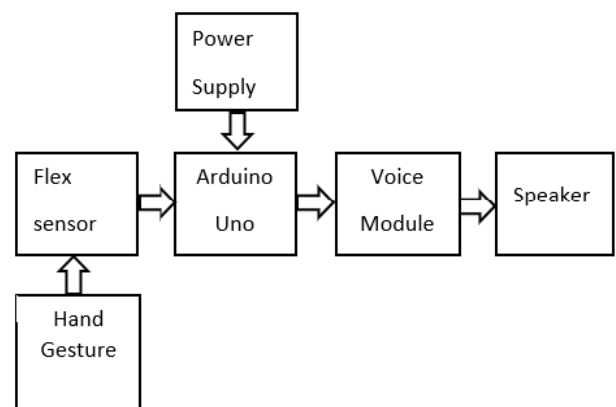


Fig 2.1 Block diagram of system

III. SYSTEM DESCRIPTION

The recognition of gesture is done by wearing the gloves which are fitted with flex sensors each of 2.2 on the five fingers of the glove. The output of flex

sensor is in the form of variations in resistance in accordance to the bend of fingers. The output of flex sensor is directly given to the ADC channel of microcontroller. The ADC output of each channel is processed and a specified value is assigned to each gesture. The ADC will convert the analog signal into the digital. There are eight channel in the voice module(APR33A3). We can use 8 channels(M1 to M8) for audio recording each channel having 1.3 minutes recording length. We can record 1,2,4 or 8 voice messages. The user can record and play the message by switch.

IV. HARDWARE REQUIREMENT

4.1 ARDUINO UNO

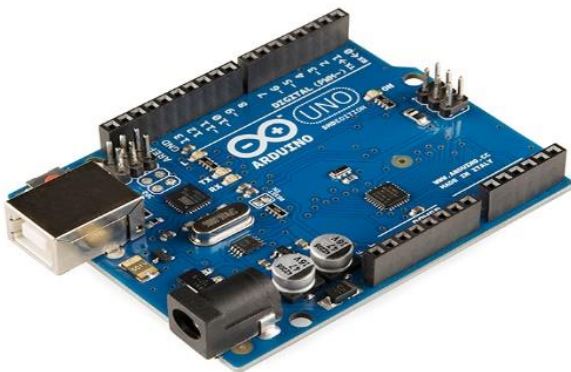


Fig 4.1 Arduino Uno

The Arduino uno is an open-source microcontroller board based on the microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion board and other circuits. The board has 14 digital I/O pins (out of six are PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE via type B USB cable.

4.2 FLEX SENSOR



Fig 4.2. Flex Sensor

A flex sensor is basically a variable resistor that varies in resistance upon bending. Since the resistance is directly proportional to the amount of bending, it is often called a **Flexible Potentiometer**. So that the resistance increases depend on surface linearity. When the flex is completely linear it has its nominal resistance. When it is bent 45 degree angle flex sensor resistance increases to twice as before. When the bent is 90 degree angle the resistance could go as high as four times the nominal resistance.

4.3 VOICE MODULE(APR33A3)

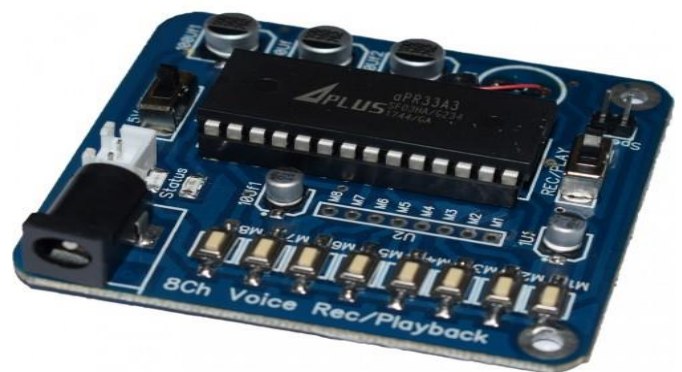


Fig 4.3 Voice Module(APR33A3)

APR33A3 is a 8 channel voice record and Audio playback board integrated with APR33A series IC which is a powerful audio processor along with high-performance audio analog to digital converters and digital to analog converters. The APR33A series is

specially designed for the simple key trigger. The user can record & play the message by a switch and be adjusted the sample rate by using different values of resistor.

1.4 SPEAKER

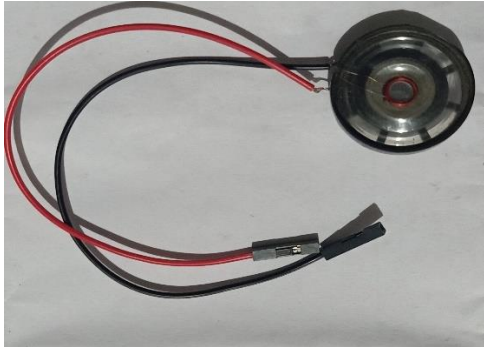


Fig 4.4 Speaker

It is a small mini speaker. Speaker is term used to describe the user who is giving vocal commands. It is generally use for all types of audio projects. The speaker with resistance 8 ohm and power rating 2W.

V. RESULT AND ANALYSIS

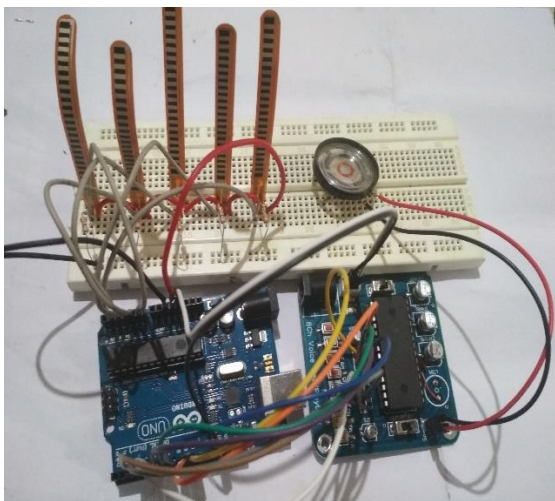


Fig 5.1 The original model

VI. CONCLUSION

This system aims to lower the communication gap between the deaf or community and the normal world. The project proposes a translational device for deaf-mute people using glove technology. The proposed technique has enabled the placement of five flex sensor and an voice module on to a glove to detect the gestures of a person. As this system is having its voice output in regional language, it can be used as a translator to communicate with people of different regions with ease. To expand the systems capability, Camera for facial detection can also be installed for better communication.

VII. REFERENCES

- [1]. <http://ijcsn.org/IJCSN-2015/4-1/Hand-Gesture-Recognition-to-Speech-Conversion-in-Regional-Language.pdf>
- [2]. https://www.ripublication.com/irph/ijisaspl2019/ijisav11n1spl_31.pdf
- [3]. <https://ieeexplore.ieee.org/document/8728538>
- [4]. <http://ijcsn.org/articles/0401/Hand-Gesture-Recognition-to-Speech-Conversion-in-Regional-Language.html>

Cite this article as :

Snehal Santosh Jagtap, Ashwini Sunil Jadhav, Girija Santosh Kadekar, Prof. Vyavhare V. A, Prof. Divekar S. N., " Hand Gesture Recognition and Speech Conversion, International Journal of Scientific Research in Science, Engineering and Technology(IJSRSET), Print ISSN : 2395-1990, Online ISSN : 2394-4099, Volume 7, Issue 3, pp.389-393, May-June-2020.

Journal URL : <https://ijsrset.com/IJSRSET2183205>