

# Gesture Vocalizer

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## Abstract

The important reason of this paper is to confer the machine that converts a given signal utilized by a disabled man or woman into its suitable textual, audio, and pictorial shape the use of additives along with Arduino Mega, Flex sensors, Accelerometer, which will be understood with the aid of using a not unusualplace man or woman. A wearable glove controller is designed with flex sensors connected to every finger, which lets in the machine to feel the finger movements, and a Gy-sixty one accelerometer, which it makes use of to feel the hand motion of the disabled man or woman. The wearable enter glove controller sends the amassed enter sign to the machine for processing.

**Keywords:** Disabled, Glove, Finger Movement.

## 1. INTRODUCTION

Living withinside the privileged galaxy of intellects and witnessing a technical revolution in regular existence it's far vital now no longer to miss the obligation to make use of era which will make a contribution to the development and improvement of society at large. Communication is the essential foundation for any character to stay a regular existence. As in step with the definitions provided via way of means of Mospì [7], someone who can't pay attention in any respect or can pay attention simplest loud sound is taken into consideration as listening to mute. A individual who's dumb or whose speech isn't understood via way of means of a listener of regular comprehension and listening to is taken into consideration to have speech incapacity. A individual who's not able to talk because of speech issues is taken into consideration as mute. Mostly applicants who're listening to disabled also are speech disabled. In an intensive studies carried out in diverse domains, it turned into observed that listening to impairment and incapacity to verbally explicit oneself results in loss of same possibilities in addition to results in troubles even in regular communication.

According to JICA [8] information profile on incapacity in India, listening to ailment debts for 8.36% and speech ailment debts for 5.06% in India. Disability information offer proof approximately the underlying trouble itself, together with gender variations and occurrence of incapacity in society. Disability information additionally offer us a wealth of statistics approximately distinct forms of disabilities, variety of humans suffering from those disabilities and the boundaries they face of their existence. One of the foremost limitations a disabled individual faces in his existence is incapacity to speak with a regular individual.

People who be afflicted by listening to and/or speech ailment may be a sufferer of social isolation. Hearing impaired or speech disabled people can turn out to be goals of bullying amongst regular humans because of their issues. The bullying can bring about reducing of shallowness in listening to or speech impaired people, specially amongst younger children.

## **2. NEED OF THE PROJECT**

Sign language can be useful to ease the communication among the deaf or mute network however typically while it comes to speaking with the world, they discover it hard and it is being the best demanding situation of their life. Despite the reality that the deaf and dumb human beings can impart without troubles among themselves, there may be the extreme task for the listening to or impaired man or woman looking to talk with ordinary human beings. This is due to the fact now no longer unmarried normal human beings can realize their gesture primarily based totally communicate. The extra part of everyday people has now no longer been taught approximately the signal language. As communication is imperative, this troubles necessarily makes a problem for the impaired people to correspond with the ordinary.

## **3. OBJECTIVE**

Sign language can be a beneficial to ease the conversation among the deaf or mute network however typically while it comes throughout speaking with the world, they locate it hard and its being a best demanding situations of their life. Despite the reality that the deaf and dumb humans can impart with out problems among themselves, there's critical task for the listening to or impaired individual seeking to speak with ordinary humans. This is due to the fact now no longer each unmarried usual humans can recognize their gesture primarily based totally conversation. The more a part of regular people has now no longer been taught approximately the signal language. As conversation is imperative, this problems unavoidably makes a problem for the impaired people to correspond with the ordinary.

### **3.1 To help mute people to communicate easily**

Using gesture vocalizer, now mute people can communicate easily with any person .this makes much easier for mute people to socialize.

### **3.2 Help dumb people to socialize**

People who suffer from hearing and/or speech disorder can be a victim of social isolation. Hearing-impaired or speech-disabled persons can become targets of bullying among normal people due to their disorders. Bullying can result in lowering self-esteem in hearing or speech impaired persons, especially among young children. Gesture vocalizer helps them to socialize easily.

### **3.3 To improve self-esteem**

Due to physical disability self-esteem of a person collapses. Gesture vocalizer will rebuild their self-esteem.

### **3.4 Reduce the burden of learning sign language by all family members.**

Presently all the family members have to learn sign language to communicate with their dumb family member. This is tough. Now using gesture vocalizer audio will be the output so no need to learn sign language by all family members.

#### 4. PROPOSEDSYSTEM

The foremost functionality of Gesture Vocalizer is to provide a voice to mute people. Now not everyone needs to learn sign language to communicate with mute people. Gesture vocalizer will give audio output from within the gloves, so no need to carry multiple pieces of equipment also. In the gesture vocalizer, we had used 4 flex sensors, an accelerometer, sd card module, small speakers, Arduino UNO. here person use sign language to the values to changes in resistance in flex sensor installed on fingers and upward and downward movement of hands is measured by accelerometer. This raw data is provided by Arduino which will process the information and select the desired audio file to play. We can store lakhs of commands in sd card module. We have connected speakers in parallel to get the maximum output.

#### 5. IMPLEMENTATION DETAILS

The below diagram gives the flow chart of the system. It shows the whole process systematically done by the proposed project. It contains three parts, in first the data is sensed with the help of sensors, in second the sensed data is matched with the pre-defined data, and in the last part the condition found is announced

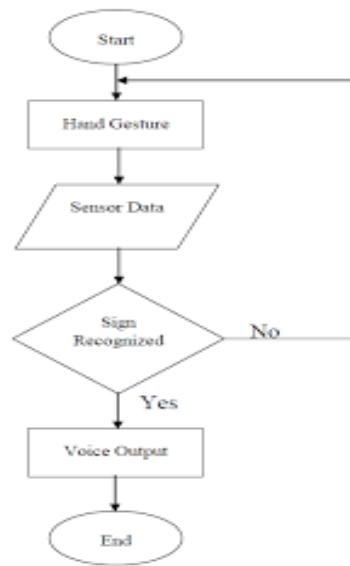


Fig 2 Flow Chart of Gesture Vocalizer

- We are converting hand gestures to desirable audio output.
- We are inspecting with the help of different sensors.
- We are checking fingers and hands movement and give output according to that.
- In this data is stored in the memory card and using sensor info Arduino selects the sound to play.

## Stage 1

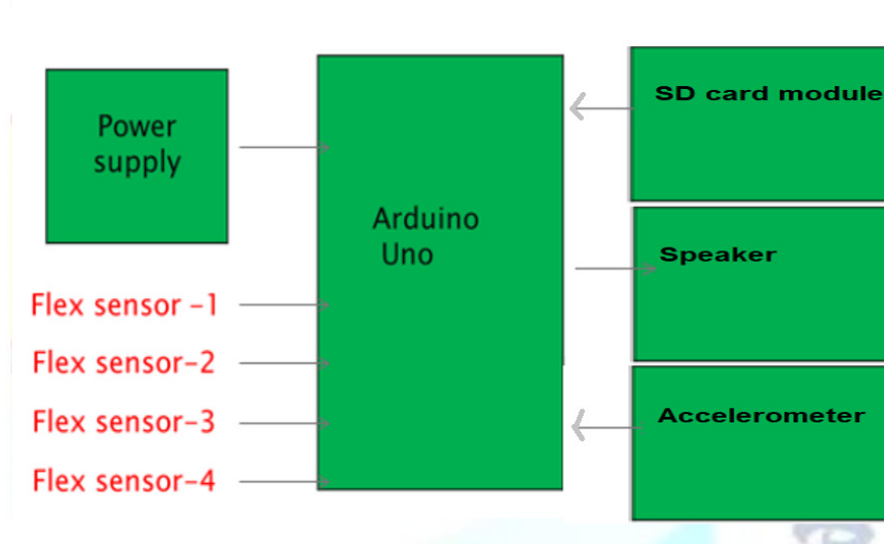
### a) Recognizing resistance in flex sensor

This sensor works on the bending strip principle which means whenever the strip is twisted then its resistance will be changed. This can be measured with the help of any controller.

This sensor works similar to a variable resistance because when it twists then the resistance will be changed. The resistance change can depend on the linearity of the surface because the resistance will be dissimilar when it is level.

When the sensor is twisted 45 then the resistance would be dissimilar. Similarly, when this sensor is twisted to 90 then the resistance would be dissimilar. These three are the flex sensor's bending conditions

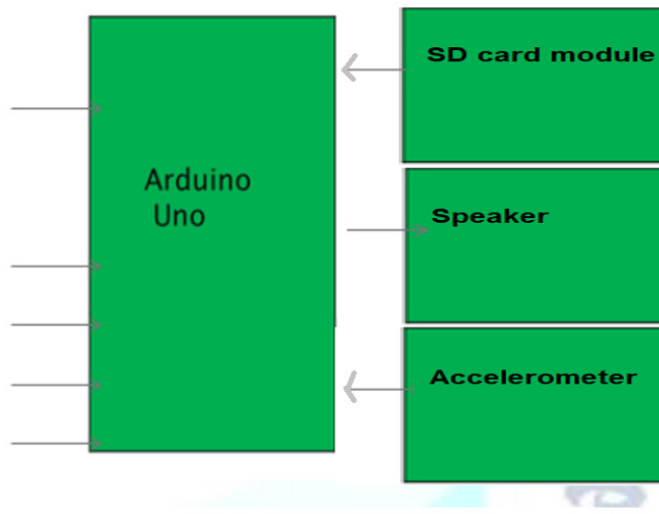
According to these three cases, the resistance will be normal in the first case, the resistance will be double as contrasted with the first case, and the resistance will be four-time when compared with the first case. So the resistance will be increased when the angle is increased.



## Stage 2

### b) Working of Ardrino

- Ardrino will receive the sensor information(flex and accelerometer).
- According to the data it will select the desired file to play.
- Files are stored inside sdcard module.



Stage 2 Block diagram

## 5.1 HARDWARE IMPLEMENTATION

### Circuit Design of the Setup

This is an Arduino-based Gesture Vocalizer. This project is entirely based on an Arduino controller and this paper will give you a good understanding of this system. In this paper, we have provided a step-by-step method so that you can construct this system.[20]. The circuit implementation of the proposed work is shown in figure 4.

### Flex sensor to controller pin information

The sensor has two pins: VCC, Trig, Echo, and GND. Connect:

- VCC pin to 5V on controller (Nano)
- GND pin to GND on controller (Nano)

### Accelerometer to controller pin information

Accelerometer has five input pins:

- First connect the GND to Arduino's GND (UNO)
- Pin VCC to Arduino's 5V
- Pin X to Arduino's Analog Pin A5
- Pin Y to Arduino's Analog Pin A4
- Pin Z to Arduino's Analog Pin A3

### Sd card Module to controller pin information

Sd card module has 6 pins:

1. Connect VCC with 5V in the Arduino.
2. Then, connect the GND of SD card to the ground of Arduino.
3. Connect CS to pin 14.
4. Connect SCK to pin 13.
5. MOSI connect to the pin 11.
6. Connect MISO to pin 12.

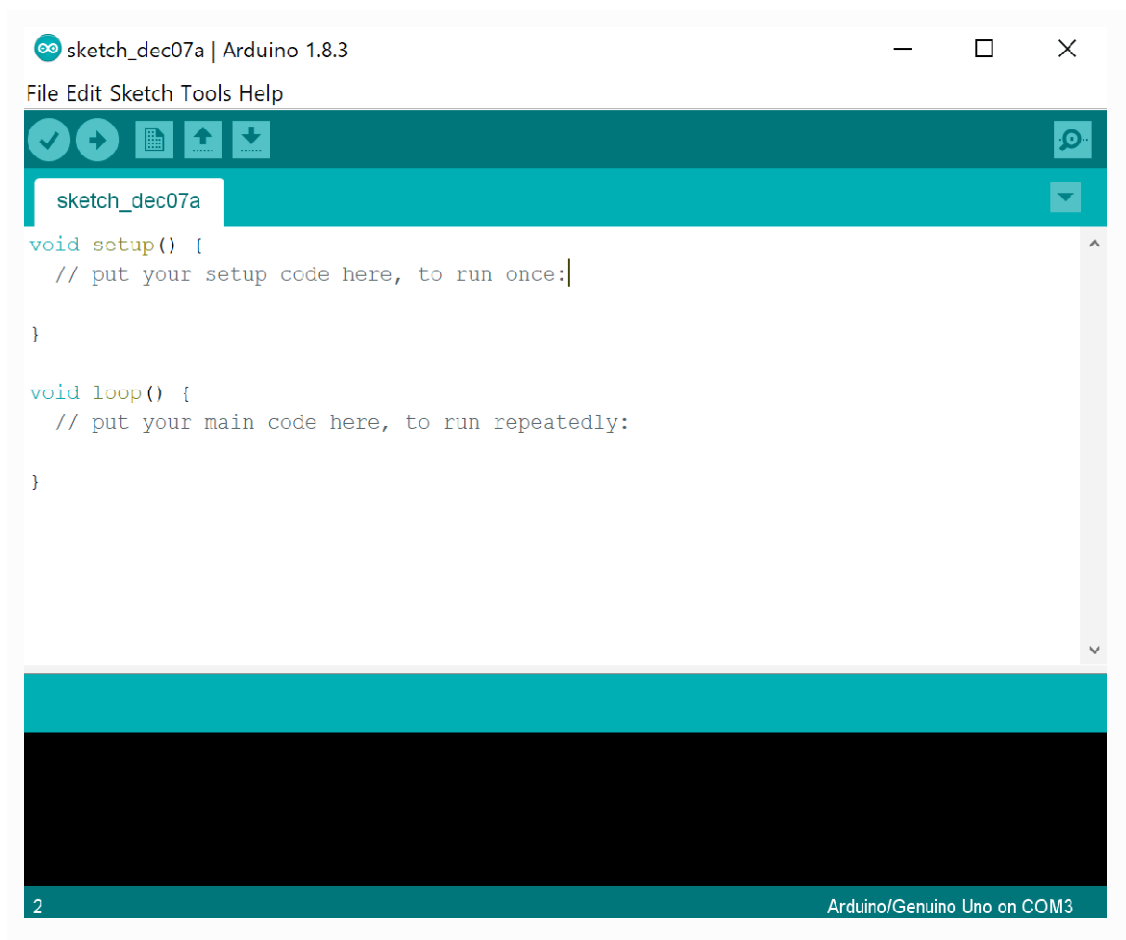
### Speaker to controller pin information

The Relay has 2 pins:

1. Connect the positive lead to Arduino digital pin 8. ...
2. Connect the other lead to the 100 ohm resistor, and then to ground.

## 5.2.SOFTWARE DESIGN

Ardrino ide is used for coding in adrino uno.



## 6. RESULTS AND DISCUSSIONS

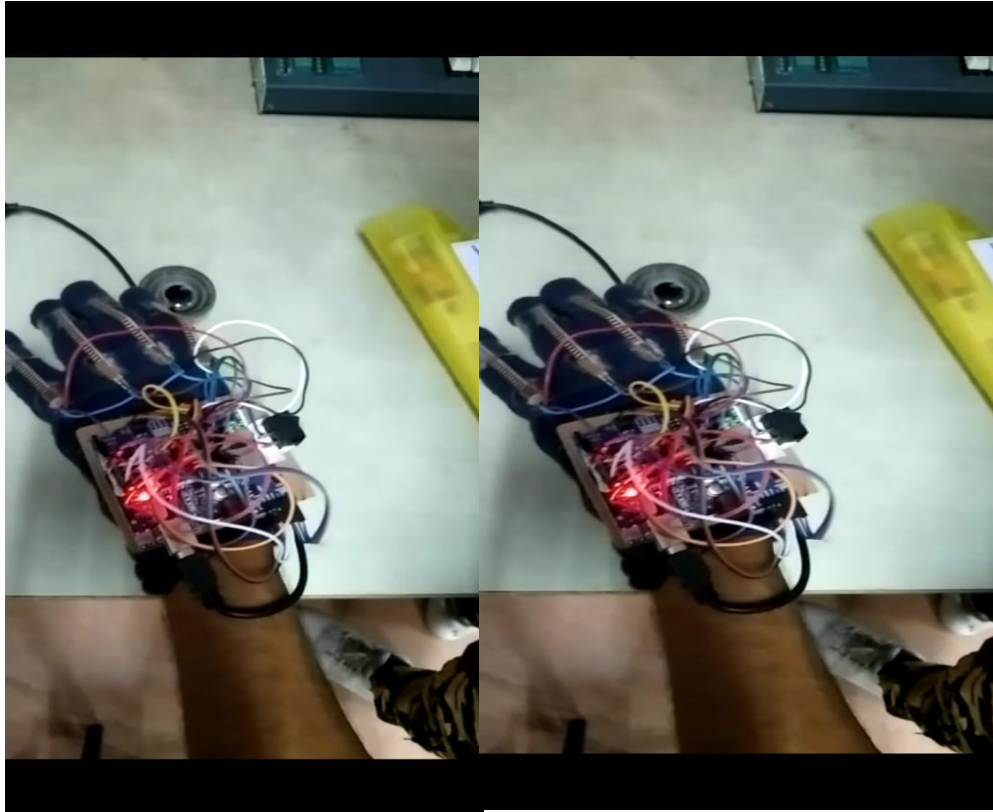


Fig. 5: Gesture Vocalizer providing audio output when hands are moved in specific position

## 7. CONCLUSION

This studies paper describes the layout and running of a device this is beneficial for dumb, deaf, and blind humans to speak with each other and with ordinary humans. The dumb humans use their widespread signal language which isn't always without difficulty comprehensible with the aid of using not unusualplace humans and blind humans can't see their gestures. This device converts the signal language right into a voice this is without difficulty comprehensible with the aid of using blind and ordinary humans. The signal language is translated into a few textual content form, to facilitate the deaf humans as well

## 8. FUTURE SCOPE

This studies paper describes the layout and running of a machine this is beneficial for dumb, deaf, and blind humans to speak with each other and with ordinary humans.

The dumb humans use their popular signal language which isn't without problems comprehensible through not unusualplace humans and blind humans can not see their gestures. This machine converts the signal language right into a voice this is without problems comprehensible through blind and ordinary humans. The signal language is translated into a few textual content form, to facilitate the deaf humans as well

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