

## Communicator for Blind and Dumb People

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### Abstract

This paper provides technical method for poor eye sight persons or the blind and dumb person to communicate each other without any third person's help. The main parameters are hand gesture sensing, RF communication, sound output. The aim of the idea is to provide a gesture sensing gloves to the visually impaired one, a hand hold which shows a sound as output. This is done with help of flex sensors and sd-card module with speakers, whereas the flex sensing gloves detects the hand gestures and transmit the signals through a radiofrequency transmitter. This transmitted signal is received in the other and shows the signal as a sound output using speaker by the already recorded sounds in the sd-card module. They can communicate each other easily without anyone's help

**Keywords:** arduino nano, flex sensors, dumb people, visually impaired, speakers.

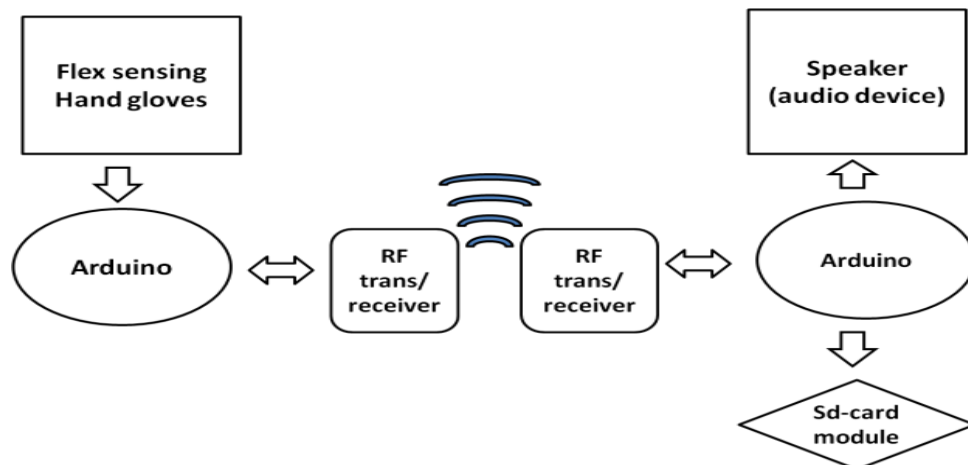
### 1. Introduction

There are numerous people who have distinctive sort of handicaps. As shown by the World Health Organization, around 285 million people in the world are VISUALLY IMPAIRED, 300 million are HARD OF HEARING and 1 million are MUTE. In regular day to day existence correspondence between a visually impaired and imbecilic individuals is constantly been testing, consistently there will be a transitional for their correspondence on the grounds that the visually impaired can't ready to see the hand offers of the idiotic individuals so they are consistently needing somebody's assistance. Here this can be accomplished by this communicator. Our fundamental proverb is to lessen the expense for the helpless people groups, in light of the fact that almost 70% of these people groups are beneath neediness line so they can't manage the cost of more cash for this India and some different nations.

### 2. Objective

The aim of the venture is to determine the issue of vision with the low, individuals who are authoritatively delegated daze people. Also, individuals who can't ready to talk, formally named stupid people. This can be accomplished by this communicator. In this a motion detecting gloves and a Braille console will be given. Where as an imbecilic individual can't talk so he will impart utilizing hand motions, yet the outwardly weakened one will be unable to see those motions. So the flex sensors which is available in that signal gloves will separate each motion and send comparable information of the individual motion to the speaker console through the RF transmitter by preparing in ARDUINO nano. In inverse side the RF collector will get the information and cycle it through the ARDUINO and give the yield through the a sound gadget ( speaker ).

### 3. Blockdiagram



**Fig. 1.**Functional diagram

Fig.1 is a functional diagram represents the working process of the communicator. It consist of two ARDUINO nano, two pairs of RF transmitter and receiver, five flex sensing sensors which will placed over each fingers of a hand and six push pull solenoids. Finally based on the requirement of the user an audio speaker will be placed for the convenience of the visually impaired one. The ARDUINO is a less price miniature CPU which will be connected to the computer.

### 4. Hardware Requirements

- Arduino nano
- RF transmitter and receiver
- Flex sensors
- Arduino sd-card module
- ADXL335 module
- Speakers
- 12v battery

### 5. Arduino Nano

The Arduino Nano is a little, complete, and breadboard agreeable board dependent on the ATmega328 (Audrino Nano 3.x). It has pretty much similar usefulness to the Arduino Duemilanove, however, in an alternate bundle, it needs just a DC power jack and works with a Mini-B USB link rather than a standard one.

#### Arduino Nano Features

- ATmega328P Microcontroller if structure 8-cycle AVR family
- The operating voltage is 5v
- Input voltage (Vin) is 7V to 12V
- Input/yield pins are 22
- Analog I/p pins are 6 from A0 to A5
- Digital pins are 14
- Power utilization is 19mA
- i/o pins DC is 40mA
- flash memory is 32KB
- SRAM is 2KB
- EEPROM is 1KB
- CLK speed is 16MHz
- Weight is 7g
- Supports three correspondences like SPI, IIC, and USART



## 6. RF Transmitter and Receiver

As the name recommends, the RF module works at Radio Frequency. This recurrence range differs between 30 kHz and 300 GHz. In this RF framework, the computerized information is addressed as varieties in the sufficiency of transporter wave.

### RF Features

- The Receiver recurrence 433MHz
- Recipient regular recurrence 105 Dbm
- Recipient supply current 3.5 mA
- Low force utilization
- the working voltage of the recipient is 5V
- The transmitter recurrence range 433.92MHz
- The supply voltage of the transmitter is between 3V to 6V
- The yield force of the transmitter is between 4Dbm to 12Dbm



## 7. Flex Sensors

As a variable printed resistor, the Flex Sensor accomplishes incredible structure factor on a slim adaptable substrate. At the point when the substrate is bowed, the sensor creates an obstruction yield corresponded to the twist sweep—the more modest the range, the higher the opposition esteem. An unflexed sensor has an ostensible opposition of 10,000 ohms (10 K). As the flex sensor is bowed the opposition continuously increments. At the point when the sensor is twisted at 90 degrees, its obstruction will go between 30-40 K ohms.

### Flex Sensors Features

- The working voltage of FLEX SENSOR: 0-5V
- Can work on LOW voltages
- Force rating : 0.5Watt (constant), 1 Watt (top)
- Life: 1 million
- Working temperature: - 45°C to +80°C
- Level Resistance: 25K  $\Omega$
- Obstruction Tolerance:  $\pm 30\%$
- Curve Resistance Range: 45K to 125K Ohms(depending on a twist)

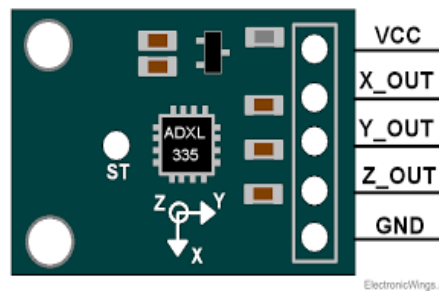


## 8. ADXL335 Board

The ADXL335 is a little, slight, low force, total 3-pivot accelerometer with signal molded voltage yields. The item estimates speed increase with a base full-scale scope of  $\pm 3$  g.

### ADXL335 Module Features

- 3-pivot detecting.
- Little, low profile bundle.
- $4\text{ mm} \times 4\text{ mm} \times 1.45\text{ mm}$  LFCSP.
- Low force :  $350\text{ }\mu\text{A}$  (ordinary)
- Single-supply activity:  $1.8\text{ V}$  to  $3.6\text{ V}$ .
- 10,000 g stun endurance.
- Phenomenal temperature strength.
- BW change with a solitary capacitor for every hub



## 9. SD-CARD Module

Its is a small board which helps in connecting sd-card with the arduino .

### SD-CARD Module Features

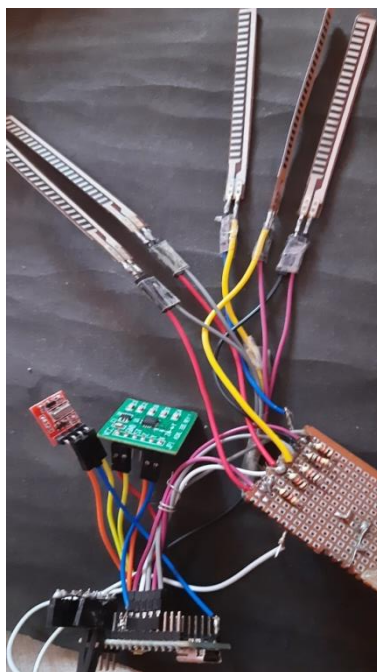
- Backing Micro SD Card, Micro SDHC card (rapid card)
- The level transformation circuit board that would interface be able to level is  $5\text{V}$  or  $3.3\text{V}$ .
- Force supply is  $4.5\text{V} \sim 5.5\text{V}$ ,  $3.3\text{V}$  voltage controller circuit board.
- The correspondence interface is a standard SPI interface.
- 4 M2 screw situating openings for simple establishment.



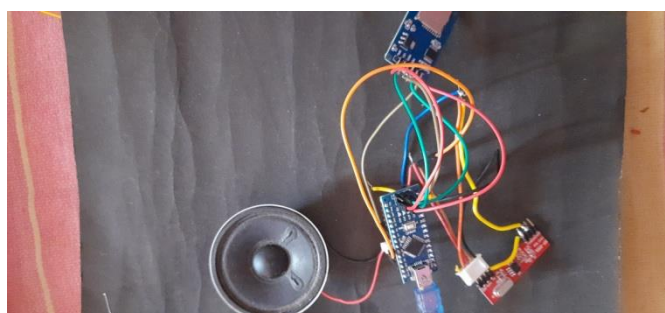
## 10. Hardware Working Process

In transmitter side which is for dumb people a gloves which has flex sensors on each fingers will be given, whereas they used to communicate with hand gestures. Each when they make a gesture a resistance will be created in side the flex sensors so that using that resistance value a binary code will be generated. This binary codes have separate number, this will be transmitted to the receiver. In receiver side for the blind people a audio device will be given, the received binary and the number will play the specific audio. So that they easily communicate each other. In order to save the audio sd-card is used whereas the ARDUINO cannot able to read the audio files, so the audio files are converted in to mp3 to wav form and stored. These files will be read through sd-card module by the ARDUINO NANO. With the help of speakers the audio will reach the person.

## 11. Prototype Image



1. Transmitter side (dumb people)



2. Receiver side (blind people)

## 12. Conclusion

This method is implement to reduce the inconvenience in communicating between the blind and dumb people. Day to day there is a gradual increase of birth of disabled child due to improper diet and unhealthy food taken by the mother. Here the blind and dumb people are facing many challenges in the day to day life, one of the major challenge is communication. The dumb one can only communicate through the hand gestures or by writing, but the blind one cannot communicate with them by this, they can only hear or feel. So in this condition our prototype will play a major role in it. The gesture gloves detect the gesture done by the dumb one and sends the data to the receiver blind one. Here the RF transmitter and receiver are used to transmit the data or signal. There are many solutions but this cost effective and smaller in size so that everyone can easily utilize it easily.

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