



## Magic Hands For Deaf and dumb people

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**Abstract :** Communication is the best media for the people to share their views with each other. About nine million people in the world are deaf and dumb. The Communications between deaf- dumb with a normal person have always been a challenging task. Deaf and dumb people usually communicate via language, a form of illustration of words through hand and finger positions. To minimize this communication gap between normal person and these people for better interaction, we are developing an electronic device that can translate the sign language which is converted into speech in order to make proper communication between deaf and dumb people with normal person.

**Keywords** – Sign Language Translation, Sensor Based Communication, Bluetooth module

### I. INTRODUCTION

We often saw most of the dumb and deaf are unable to communicate with us because of this situation this unsecured in our society. Many of us often make fun of them but we don't understand what problems they are facing. Our paper Magic Hand is totally dedicated to such kind of special people, there are too many projects available in the market that claim to convert sign language into voice/speech but at a very high cost, the cost varies from 20,000/1,00,000. But some people cannot express their feelings, emotions through word and sound those people are called deaf and dumb. These people can express their feelings and emotions by using gestures and sign language but normal people don't understand their sign language, so for the proper communication between deaf and dumb with the normal person, we are developing one device. Every day we see many people who are facing an illness like deaf, dumb and blind etc. They face difficulty while interacting with others. They cannot adapt to the surrounding environment quickly and respond to other normal people and expressing themselves is hard. Over the world, 9 million of the total population suffers from deafness and dumbness. The record of sign language started in the 17th century as a visual language or method of communication. A sign language is composed of a system of conventional gesture, mimic, hand sign and figure spelling, plus the use of hand position to represent letters of the alphabet. The sign can also represent a complete idea or phrase. Whereas we are making this project at a very low-cost so that every special person can afford it

## II. LITERATURE REVIEW

We have searched and read different papers from Google and other sources and also we have referred other conference papers to gather more information which would help us in designing and developing our project.

### 1. Divyahast Gesture Vocalization: A Case Study.

It was published in year 2020 and author names followed as Dr. B. D. Phulpagar, et al. In this project they have shown that combination of flex sensors, accelerometer and Arduino can be used to detect and classify five different types of hand gestures. First we start the system then for input: for particular gesture, sensor data Input ( 5 sensors data & 3 axis accelerometer data) flex Movement is observed value : antilog Read (flex Pin): Then Adds delay of 10 milliseconds. Convert row sensor data to meaningful data using Dynamic Time wrapping, averaging value is calculated for mapping the gesture connect.

### 2. A Novel Communication System for Deaf and Dumb People using gesture.

It was published in year 2020 and author names followed as Pritesh Ambavane, et al. In this paper they designed and develop a data glove for communication of dumb and deaf people. System is effective and efficient because the use of AVR microcontroller and android phone. Flex sensors are attached to the gloves. These flex sensors contain the continuous flow of current voltage. These sensors when bend creates a drop in voltage which in turn is recorded in microcontroller the analogue input data from flex sensors is converted to digital form by micro controller. Microcontroller sends the digital data to the mobile device using Bluetooth module wirelessly. The Bluetooth module used in this system is HC-05. The digital signal which is transferred from the microprocessor is recorded in the android device. There is the fix algorithm for every input and according to the input the output is generated in the device.

### 3. Flex sensor integrated hand glove to assist multi- disabled people.

It was published in year 2021 and author names followed as T.Lakshmi prasanna, et al. The proposed project involves converting finger movement into meaningful information. This information is communicated via a wireless communication device such as Bluetooth and an Android cell phone app is used to convert text to speech. Internally, the glove is fitted with four flex sensors. The flex sensor generates a proportional change in resistance for each particular gesture. The outcome of the glove is also displayed in LCD display for visual communication. Vibrators are also used to recognize finger movements through touch and also spoken out by mobile speaker.

### 4. Deaf and mute to normal people communication assistant gloves.

It was published in year 2019 and author names followed as Someshwar Male, et al. In This Paper, the user forms a sign and holds it for two seconds to ensure recognition. The system is capable of recognizing signs additional quickly than this absolute two second limit. The controller employed in the device is an Arduino Lilypad. Five flex sensors are accustomed to measure the degree of bending of the fingers. The flex sensors are interfaced with the controller using the voltage divider circuit.. The controller has two modes of operation – training mode and operational mode [8]. In training mode, the gestures are made by the user and the voltage levels are stored in EEPROM. In operational mode, the data is being compared with predefined values and the matched gestures are sent to text to speech conversion application.

### 5. Hand Gesture Recognition for Deaf and Dumb People Using GSM Module.

It was published in year 2016 and author names followed as Shital P.Dawane, et al. This proposed system helps the mute peoples which communicate with normal peoples in mobile phones by using hand gloves shapes. In this system we are taking input from flex sensor which capture digital pattern and display corresponding data on LCD. Then we are making call using GSM module. If call is received by person then it will play a voice message otherwise it will send corresponding text message.

### III. METHODOLOGY

The flex sensor measures the bending of fingers according to gesture and outputs change in resistances corresponding to the amount of bending. Accelerometer sensor measures the linear movements of hand in X-axis and outputs different values of X corresponding to the movement in X- axis. All the data's from sensors are then processed on Arduino UNO involves combination of all the sensor outputs in order to match the resultant output with pre- stored values of different signs regarding the alphabets. For this, appropriate ranges are set for each alphabet and the words that can be recognized with single hand based on the measured data obtained from repeated measurements. A Bluetooth module is connected to Arduino UNO. The Processed data's are then transferred to the Bluetooth module (transmitter) obtained in string format. The Android mobile also have an inbuilt Bluetooth capability. These two Bluetooth devices are then paired, and string is transmitted to Android mobile. Android mobile receives data via Bluetooth in bytes format, convert them into string. Finally, the string is converted into voice using the text to speech application of Android mobile. This overall system is mounted over a normal glove for easy handling and recognizes the hand gestures accurately.

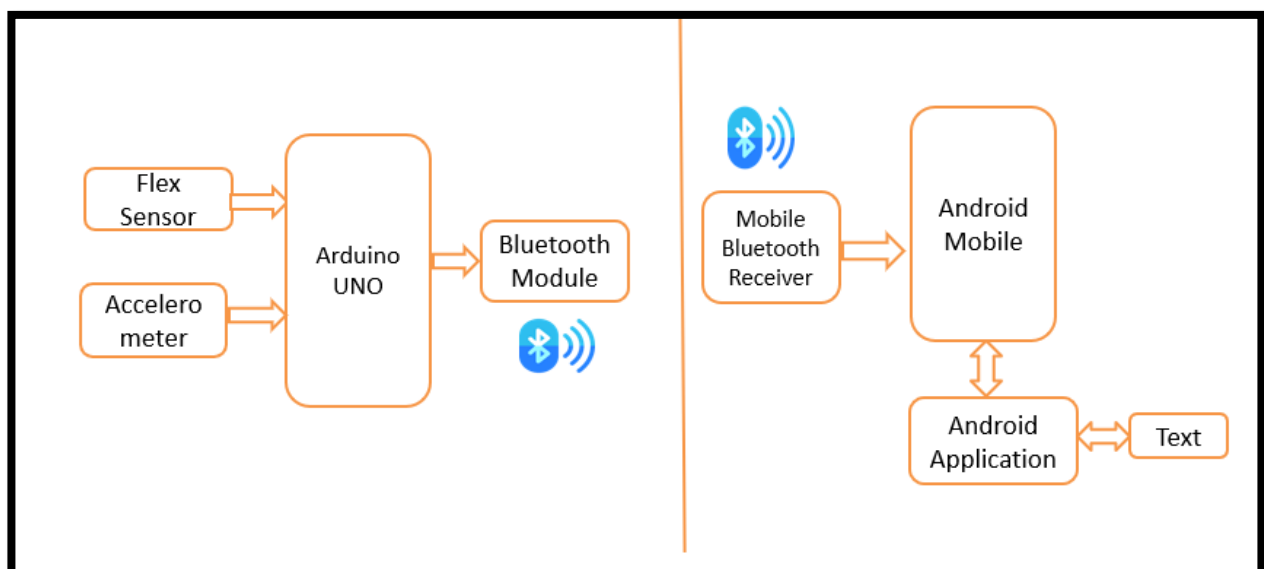


Figure.1

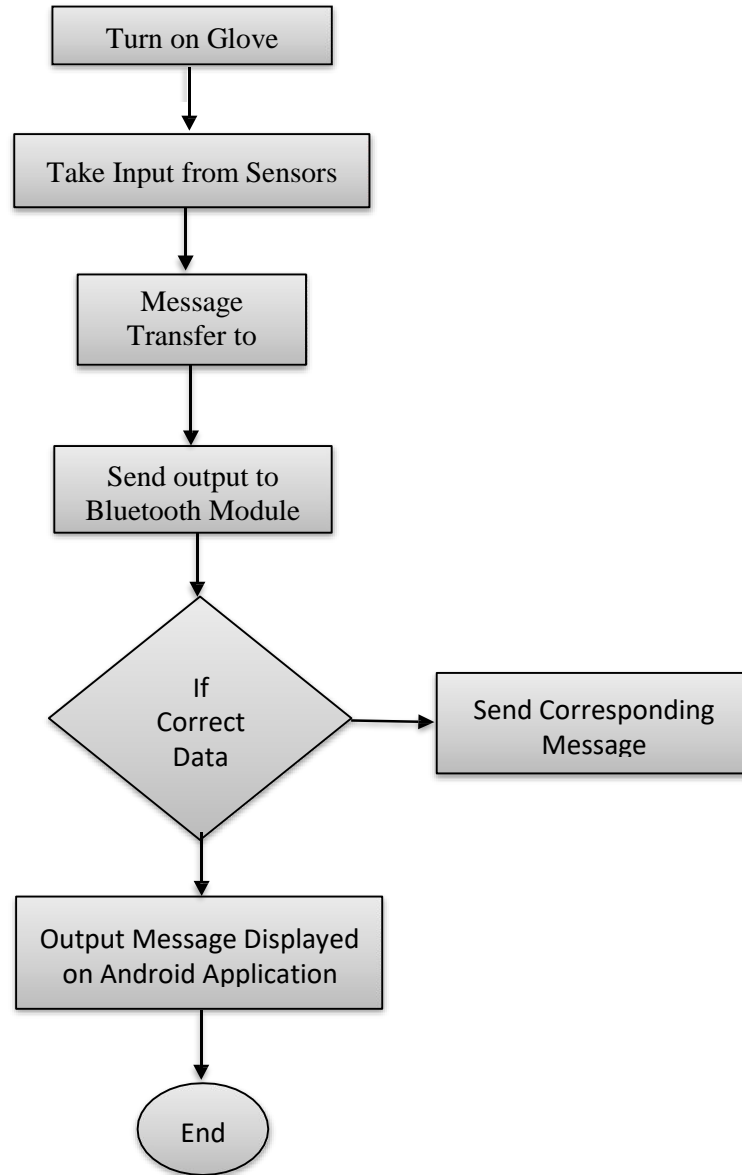


Figure. 2

Figure 2 shows the flowchart of overall process. As we give input through the flex sensor. This input gets transferred to the Arduino and Arduino checks if the data is stored in the database, if the data is stored the output is displayed on android application in text format and if data is not present in database no text is displayed on Android application.

#### IV. RESULTS

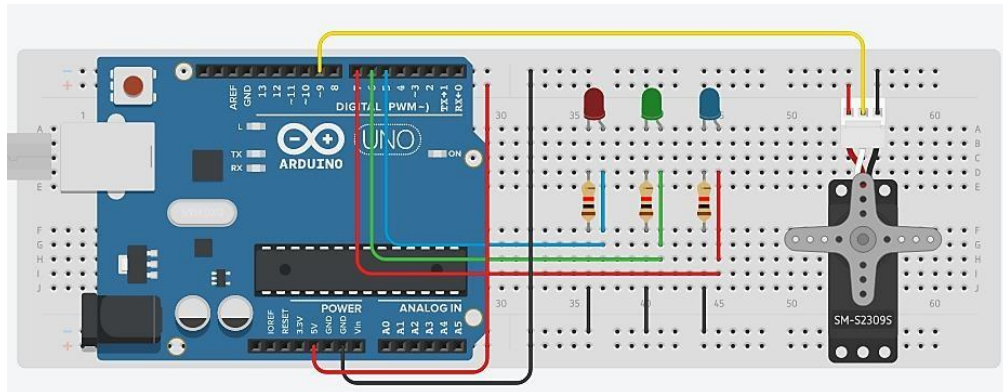


fig.3

When angle is less than 90 degrees, then the servo motor moves in left direction as shown in “Fig.4”.

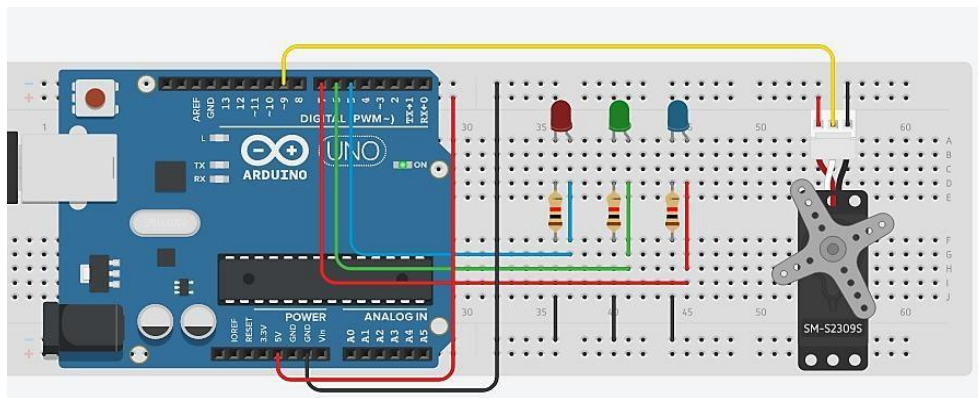


fig.4

When angle is more than 90 degrees, then the servo motor moves in right direction as shown in “Fig.5”.

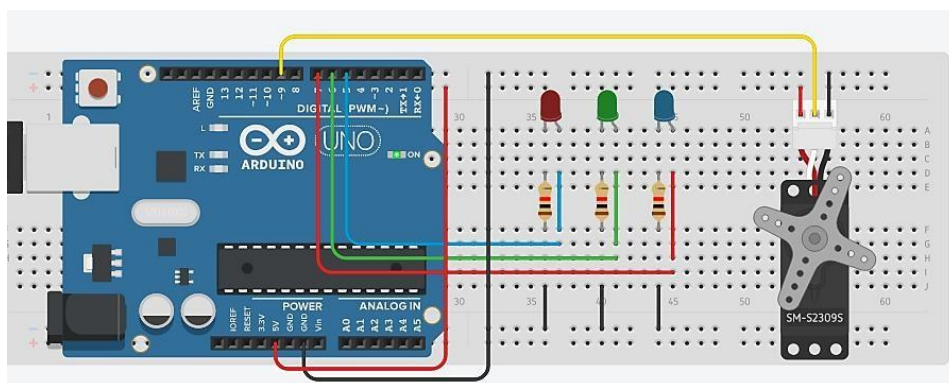


fig.5

The red led represent the remote control i.e. when led is on remote control is connected. Similarly, the blue led represent the GPS connection and the green led represent the camera connection. We expect the servo motors to move as shown in the above figures for the movement of the robot.

## V. CONCLUSION

In this paper, a system for speech impaired and hearing-impaired people using glove technology and enable normal people to communicate with them too. The use of five flex sensor, touch sensors and an accelerometer on to a glove demonstrate that it is helpful to beak the gap between speech impaired hearing impaired and normal people. This device will be an apt tool not only for the people got such disability naturally rather it also helps disability due to oral diseases and accidental cause make them to learn gesture through application easily. The project can be enhanced further by including more words and different standard sign language.

## REFERENCES

- [1] Dr. B. D. Phulpagar, et al. "Divyahast Gesture Vocalization: A Case Study "International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 08 Issue: 04 | Apr 2021 www.irjet.net p-ISSN: 2395-0072
- [2] Pritesh Ambavane, et al. "A Novel Communication System For Deaf And Dumb People using gesture. "International Journal of Advanced Research in Electrical,Electronics and Instrumentation Engineering(An ISO 3297: 2007 Certified Organization)Vol. 5, Issue 11, November 2016.
- [3] T.Lakshmi Prasanna, et al. " Flex sensor integrated hand glove to assist multi-disabled people"ITMWeb Conferences32,02003(2020) <https://doi.org/10.1051/itmconf/20203202003ICACC-2020>.
- [4] Someshwar Male, et al. " Deaf and mute to normal people communication assistant gloves"International Journal of Advanced Research in Electrical,Electronics and Instrumentation Engineering(An ISO 3297: 2007 Certified Organization)Vol. 5, Issue 11,November 2016
- [5] Shital P.Dawane, et al. "Hand Gesture Recognition for Deaf and Dumb People Using GSM Module" International Journal of Advanced Research in Electronics Engineering Vol. 5, Issue 11, November 2016
- [6] V.Purushotham, et al. " Software assistance to deaf and dumb using handshape algorithm"International Journal of Pure and Applied MathematicsVolume 116 No. 21 2017, 371-377ISSN: 1311-8080 (printed version); ISSN: 1314-3395 (on-line version)url:<http://www.ijpam.euSpecialIssue>
- [7] Sangeetha, et al. "Gesture detection for deaf and dumb people"International Journal of Engineering Research & Technology (IJERT)ISSN: 2278-0181Published by, www.ijert.orgNCFETET - 2020 Conference Proceedings
- [8] Sanish Manandhar, et al. "Hand Gesture Vocalizer for Dumb and Deaf People"International Journal of Development ResearchVol. 4, Issue, 3, pp. 749-752, March, 2014
- [9] P. Mohan, et al. "Smart Speaking Glove for Deaf and Dumb"2019 JETIR May 2019, Volume 6, Issue 5 www.jetir.org (ISSN-2349-5162)
- [10] Fadia Noori Hummad, et al. "Design and implementation of deaf and mute people interaction system"Conference Paper August 2017 <https://www.researchgate.net/publication/323647328>