

# SIGN TO SPEECH SMART GLOVE

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**Abstract** - Every Normal human being sees, listens and then reacts to the situations by speaking himself out. But there are some human beings those who are not able to speak or listen, but they try to react through actions most of time normal people are not able to understand what they want to say. This application will help for both of them to communicate with each other. It consists of several parts, in part one with the help of hand gestures the signs will be detected by the sensors and the output will be given.

**Key Words:** Arduino Mega Board, GSM module, speak or, listen , hand gestures, sensors

## 1. INTRODUCTION

Deaf-mute people need to communicate with normal people for their daily routine or to express their emotions. The deaf-mute people throughout the world use sign language to communicate with other people. However, people who undergone from sign language training only they can communicate with another peoples. Sign language uses hand gestures and other means of non-verbal behaviors to convey their intended meaning It involves combining hand shapes, orientation and hand movements, arms or body movement, and facial expressions simultaneously, to fluidly express speaker's thoughts. The idea is to create a sign language to speech conversion system, using which the information gestured by a deaf-mute person can be effectively conveyed to a normal person. The main aim of this work is to design and implement a system to translate finger spelling (sign) to speech, using recognition and synthesis techniques.

### 1.1 NEED

In today's world there is a need for people to communicate with each other to have no misunderstandings with words. In this the need of this glove has made it valuable for people who have issues in talking or speech with normal people with no issues of expressing their feelings. This is really helping people to have a better communication as the actions will be converted into speech and words on display. This glove will develop a thought of no difference in communication between every individual.

### 1.2 APPLICATION AND SCOPE APPLICATION

According to the hand gestures the words will be displayed which will be readable for deaf and listenable for blinds.

## SCOPE

Hand gesture recognition system is widely used technology for helping the deaf and dumb people. This device can be developed into a device that includes various sign languages in different countries

### 1.3 AIM

Aim is to provide isolated mobile communication system dumb people to communicate with other people, each conversing using their own natural languages. The main objective of the implemented project is to develop a reliable, easy to use, light weight smart hand gloves system which can minimize the obstacles for dumb people where they can stand with the race and can express themselves. The main objective of this project is to achieve communication of deaf -mute people like a normal person. Develop an electronic device that can translate sign language into speech.

### 1.4 PROBLEM STATEMENT

In our society we have people with disabilities and About nine billion people in the world are deaf and dumb They communicate between deaf-mute and a normal person have always been a challenging task but sign language helps deaf and dumb people to communicate with other people using smart hand gloves.

## 2. LITERATURE SURVEY

The purpose of the Literature Survey is to give the brief overview and also to establish complete information about the reference papers. The goal of Literature Survey is to completely specify the technical details related to the main project. According to the A. Gayathri<sup>1</sup>, Dr A. Sasi Kumar<sup>2</sup> text messages used as notification. Sign language is used as a communication medium among deaf and dumb people to convey the message with each other. Sign languages are languages that use manual communication to convey meaning. This can include simultaneously employing hand.[1]

According this author Dhawal L. Patel<sup>1</sup>, Harshal S. Tapase<sup>2</sup>, Praful A. Landge<sup>3</sup>, Parmeshwar P. More Prof. A. Bagade<sup>5</sup>, study the various fingers coding languages and various command mode. This paper provides detailed structure for implementing a smart glove for deaf and dumb people that can convert sign language to voice output. There have been several researches done in order to find an easier way for

non-vocal people to communicate with vocal people and express themselves to the hearing world. Developments have been made in sign language but mainly in American Sign Language. This research aims to develop a sign to Arabic language translator based on smart glove interfaced wirelessly with microcontroller and text/voice presenting devices. An approach has been developed and programmed to display Arabic text. The whole system has been implemented, programmed, cased and tested with very good results.[2]

According to Abhilasha C Chougule, Sanjeev S Sannakki, Vijay S Rajpurohit there are 2.78% of the total populations of India who can't speak. Gesture based communication is really a mode of correspondence for the general population who are either deaf or deaf-mute. Ordinary individuals don't become familiar with the gesture based communication. It causes conveyance gap between deafdumb and normal people. The past system of this project involved using image processing concept. But the downside of these past frameworks are projects were non portable and excessively costly. The aim behind this work is to build up a framework for perceiving the gesture based communication, which provides interaction between people who are deaf-dumb and normal people, thereby diminishing the interaction gap between them. Generally hearing-impaired people use linguistic communication based on hand gestures with specific movements to represent the ideas to others. The proposed system is glove that interprets American Sign Language Standard into text or speech in order to evacuate the information transmission gap between the mute and the ordinary public. This glove gives output with the assistance of flex sensors, accelerometer, microcontroller (Arduino Nano) and the Bluetooth chip[4]

**3. REQUIREMENT ANALISIS**

User: The person with disabilities will be the user to translate their actions.

**APPLICATION:**

This system works using technologies. This application gives inputs from the user and processes it to find out the proper meaning. Then it gives responses in various formats through speaker and LCD.

**4. METHDOLOGY**

In this project, gloves are implemented to capture the hand gesture made by disabled person and converting it into speech as well as text. A pair of gloves with flex sensors along each finger, thumb and arm, contact sensors and accelerometer are used to capture the movement of user. With the help of flex sensors degree of fingers thumb and arm are calculated in voltage terms using voltage divider rule enters the comparator circuit to change it from analog to digital. Contact sensors are used to recognize between some letters which have similar finger shape and differ

between another letter with little finger bending degree, and the accelerometer is to differ between letters with same hand shape but differ at gesture of the hand. Arduino is used for the processing of the entered data and decides the outputted word or letter. The letter or word that the Arduino produced get transferred to the phone that the other person (listener) is using. The phone has an android application designed by the team that present our outputted word or letter in the shape of voice and text. The expected results of the project are that it will express all the sign language letters and some of the words in both text form at the android phone and voice form at the speaker. Next Figure represents all sign language gestures.



**Figure 1.** Sign Language Letters

**4.1 IMPLEMENTATION**

In this project we connect the wire to arduino which will be attached with flex sensors and the flex sensors will be connected through resistors and the resistors will be of 47Kohms. This helps us know the resistance of the flex sensors according to movements of the user's fingers. The resistors will change values on flexing of the sensors and this way we receive the output of values. We have used the SD card module in which audio is stored for the output speech of the sign created by the user and this is also in connection with arduino. The speakers will give the output as soon as the sign is interpreted. If the user is alone in some situation and needs help immediately. He/she will make a specific sign that will help go through the user's recent contacts and send a pop up to the particular person for help in that situation. This will help the disabled person in any rough situations if alone. The sensors are embedded on it which makes it easy for them to give values. The gloves are home made for this prototype which can be easy for hand movements. It also

consists of SD card as memory to store the audio in it for the output.



**Figure 2.** implementation

## 5. CONCLUSION

During this project we face various types of challenges. We have tried to minimize the problem. By using this application deaf person can easily interact with normal person anywhere.

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