

# Gesture Based Communication System

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## ABSTRACT

Gesture based communication system is designed keeping in mind the communication needs of the people who are either bedridden or suffer from some kind of speech impairment. The main benefit of this system is that it's not necessary for some other person to be present with the bedridden person always by providing message services. It is a microcontroller based system that uses buttons present on the glove to display (on a screen) and play a particular message (through speaker) that is already stored in the system and uses joystick to compose a message not present in the system and to send the same to a person not physically there. The person can also communicate with the disabled person through a software to ensure 2-way communication. In this way, this project will help to lower the communication gap between poorly abled and normal people.

**KEYWORDS:** LCD (Liquid Crystal Display), buttons, compose message, messaging services, joystick

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## I. INTRODUCTION

In the recent years, there has been a rapid increase in the number of hearing impaired and speech disabled victims due to birth defects, oral diseases and accidents. We have also witnessed an increase in the number of semi-paralyzed and bedridden people. While speech impaired people can communicate with one another using sign language but for the normal people it is difficult to understand. Thus, it becomes difficult for such people to convey their message within the society. While many systems have been devised for them, but in all the cases the normal person has to be physically present there.

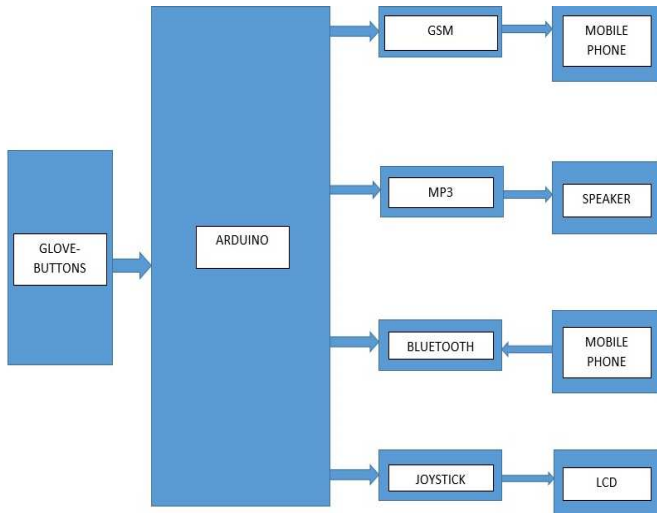
Also, in case of people who are bedridden due to old-age or some accident, they always need a person with them in case they might need anything. But in today's fast track world, it is not possible for a person to stick to a bedridden person. Thus, it is required to design a system for fulfilling their communication needs as well.

Keeping in mind the above mentioned problems, we have devised a system to overcome them. Gesture Based Communication System is a microcontroller based system that uses buttons present on the glove to display and play a particular message and uses joystick to compose a message. It also provides messaging service, in case the person is not present there. The other person can also communicate with

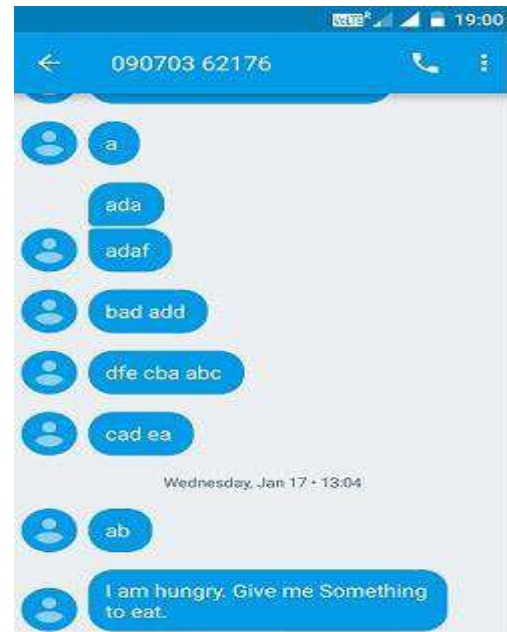
the poorly abled person using a software which displays the message on a screen. This is to ensure 2-way communication. It uses the following devices: Arduino mega 2560, glove with buttons on each of its fingers, GSM 900A module, speaker, MP3 module, Bluetooth module, analog joystick and a 16x2 LCD. The buttons have a pair of wire with one grounded and the other wire is connected to the Arduino. The GSM module, Bluetooth, joystick and LCD are also connected to the Arduino and the joystick is also connected to the LCD to form or send messages. Using the GSM module the message is sent a specific person and he can respond using an open source software connected through Bluetooth to the system.

## II. SYSTEM MODEL

The buttons on the glove, whose one end is connected to the ground on PCB and the other is connected the Arduino, are used to give various commands. The Arduino is interfaced with mp3 in such a way that the recordings in memory card of mp3 player will be played according to the conditions and the output will be produced through the speaker. The Arduino communicates serially with the mp3 player as RX and TX pins of Arduino are connected to TX and RX pins of mp3 player respectively. MP3 player is controlled by the Arduino, that is, Arduino decides the volume, which recording is to be played, etc. but does not do the work itself.



**Fig.1: Block diagram of overall system**



**Fig.3:**

The Arduino is programmed in such a way that it does not control the mp3 player when the initial recording is played in which we play the following recording “Gesture controlled communication system by Heebatullah, Zarka Latief, Nazish Ara, Sumyra Jan and Bazila Nazir of SSM College of Engineering and Technology” and the same content is displayed on the LCD. Depending upon which button is being pressed the associated action takes place.

Also a GSM module is interfaced with the Arduino. This GSM module helps the disabled person to communicate with the person who is not physically present there, i.e., the disabled person can communicate with him through SMS. Also a joystick is connected to the LCD and interfaced with the Arduino so that the disabled person can write his own message.

**III. WORKING**

Consider a situation where a person is wearing this glove. First, a battery is connected with the circuit the switch on the PCB is turned which in turn activates and connects all the devices in the circuit with the Arduino. The name of the project is also displayed on the LCD and the default recording is played through speaker. When a button is pressed, the pre-recorded message is played through speaker and the message is also displayed on the LCD, e.g. button 4 is pressed on the glove, the following recording is played: “I am hungry, give me something to eat”. Also the following message is displayed on the screen:



**Fig.2:**

The same message is also sent to a person whose no. is already fed into the system.

Also if the person wants to write his own message, he can do so with the help of joystick. The joystick can be moved in 4 directions (left, right, up, down) and these corresponding actions are performed: select alphabet, add space, change alphabet and send message. With the help of joystick the person can compile his own message.

The image displayed below, shows a sentence that is created by the user himself using the joystick the movement of joystick is described follows:



**Fig.4:**

By default “a” is displayed on the LCD. When joystick is moved in the downward direction, the alphabet changes on the LCD. When joystick is moved in the left direction, the displayed alphabet is selected and put into the word. When joystick is moved in upward direction, space is added in the composed sentence. When the joystick is moved in the right direction, the so-formed message is sent to the person whose no. is already fed into the system. Fig.3 shows the message when sent to the person whose number is fed into the system. Thus, joystick helps the person to push the boundaries, i.e., forms his own message.

**CONCLUSION**

This project will fulfill the communication needs of people who have speech or hearing impairment either by birth or due to some accident or operation or who are bedridden. While many systems have been devised for them, but in all the cases the normal person has to be physically present

there. Also, in case of people who are bedridden due to old-age or some accident, they always need a person with them in case they might need anything. Thus, to fulfill the needs of such persons we have designed this system. This system uses buttons present on the glove to display and play a particular message and uses joystick to compose a message. It also provides messaging service, in case the person is not present there. The other person can also communicate with the poorly abled person using a software (through Bluetooth) which displays the message on a screen. This is to ensure 2-way communication. In this way this project will help to lower the communication gap between disabled and normal people.

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#### FUTURE SCOPE

Since in this project we have used a joystick to compose a message of our own, we can also use a speech-generating device or voice output communication aid to convert this written sentence into a voice. This can be a special device that supplements and replaces speech/writing for people who have problems communicating in a traditional way.

The system can also be made compatible with different languages for different users.

We can also be connected with the internet to check emails, browse the net, etc.

Also we can use finger-touch device rather than the joystick. We can also introduce a system using which the normal person can message the poorly abled person and the same message can be heard using speaker.

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