

# SIGN LANGUAGE RECOGNITION FOR DEAF AND DUMB PEOPLE

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## Abstract

Deaf and dumb people use sign language for their communication but it was difficult to understand by the normal people. The aim of this project is to reduce the barrier between in them. The main objective of this project is to produce an algorithm for recognition of hand gestures with accuracy. In this project has a hand gloves model for gesture recognition. MEMS sensor is used to detecting the hand motions based on the stress. This project is used for the deaf and dumb people to communicate with normal people. The hand motions are detected by the MEMS sensor and the values are stored on the microcontroller memory unit. The output voices are previously stored on the voice processor unit. Depends on the hand motions the output will be displayed on the LCD and also played through the speaker.

**Keywords**—MEMS accelerometer, Hand motion comparison, Voice processor, Communication, Sign language

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## 1. INTRODUCTION

Sign language is a language which is used for communication between the normal people and disabled people. Sign language relies on sign patterns, i.e., body language, orientation and movements of the arm to facilitate understanding between people. In all around the world about 9.1 billion peoples are deaf and dumb. In their day to day life they faced lot more problems on their communication. In this project is used to reduce the communication gap between the normal people and disabled people. The sign language translator we have developed uses a glove fitted with sensors that can interpret the 26 English letters in American Sign Language (ASL). The glove uses MEMS sensors and accelerometers in different dimensions to gather data on each finger's position and the hand's motion to differentiate the letters.

## 2. GESTURE RECOGNITION SECTION

Gesture is defined as an expressive movement of body parts. The collection of data can be stored on the controller. The purpose of the segmentation algorithm is to find the terminal points of each gesture in a data set of gesture sequence. The data processing unit is used to perform the controlling and transferring function.

## 3. DESIGN METHODOLOGY

For previous year they used image based techniques. By using this technique we require more flexible image processing software. And another method they used cameras for an input device. By using the cameras, the captured gesture has less clarity and also it requires more power to work. The camera based techniques are more expensive.

## 4. BLOCK REPRESENTATION

These sensors are used to reduce the power and cost. It is used to detect the hand motion depends on the stress. And

also it is easily embedded with any component or circuit. The hand motions are detected by the MEMS sensor and the values are stored on the microcontroller memory unit. The output voices are previously stored on the voice processor unit. By using LCD the output will be displayed depends on the hand motions and also played through the speaker.

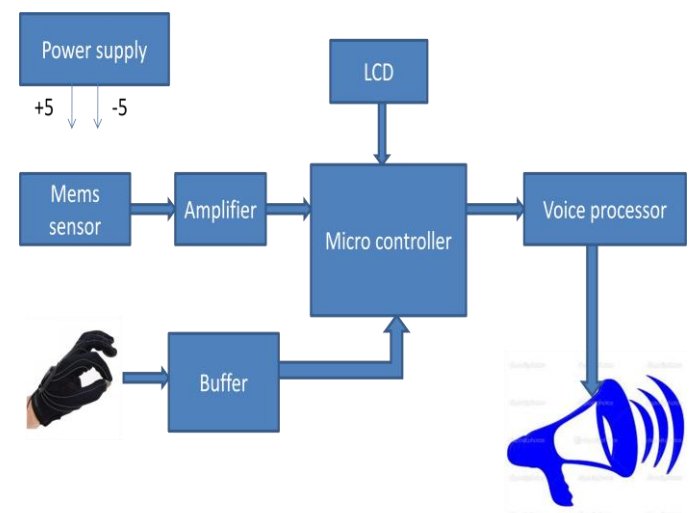


Fig 1: Block diagram

In this block the Power supply unit is used to give power source for all these units. The accelerometer produce three different states of outputs with respect to stress. The accelerometer's output will be given as the input for amplifier. The amplifier amplifies the signal and these signal will go to the input for microcontroller. The microcontroller's output will be given to voice bank as input. The voice bank produce the voice signal according to the microcontroller's output. Finally the voice output be received through the speaker and text form of the output be displayed on the LCD.

## 5. RESULTS AND DISCUSSIONS

The system has MEMS sensor for detecting the hand motions. The sensor values are stored on the microcontroller unit. Based on the hand motions the stored outputs are displayed on the LCD and also played through the speaker. Embedded C language is used to write the microcontroller program. MPLAB IDE software is used to develop the system. In this system is detect the hand motions in few seconds and also this system is got 99% accuracy.

### 5.1 Hardware



## 6. CONCLUSIONS

In this project describes the working principle of a system which is useful for deaf and dumb people to communicate with the normal people. The system has MEMS sensor for detecting the hand motions. The sensor values are stored on the microcontroller unit. Based on the hand motions the stored outputs are displayed on the LCD and same as play through the speaker.

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