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Smart Glove For Deaf And Dumb Patients

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Abstract : *Communication for speech impaired people is the biggest barrier they face in life. They use sign language to communicate but the people around them cannot understand them this can also affect their workspace but due to the technology now developed we have tried to make a smart glove which can help the communicate with people. The primary aim is to develop Smart Glove with gesture recognition that can be cost effective with good accuracy. The smart glove it implemented with flex senor attached to it that can help track the finger movement, accelerometer too with the help of microcontroller The glove is equipped with flex sensors that has reactive elements, as with each specific gesture the resistance is produced the command is then given to microcontroller for specific gesture than convert this gesture to pre-recorded voice and text with output given by speaker. This can help the speech impaired people to communicate better and be a part of large community.*

Keywords - *Flex sensor, Accelerometer, Smart glove, Gesture, Sign Language.*

I.　INTRODUCTION

In a country like India where around 1 percent of the population are deaf and dumb, their main obstacle they face is communicating with people. In a group of 10 people hardly any one would understand sign language. Communication is very important for every person and it is only can share medium by which we our feelings, thoughts but for a person with disability that faces difficult y in communication can find it very difficult to express themselves A speech impaired person was uses sign language to communicate but as most don't understand sign language, therefore with the help of Smart Glove they will be able to communicate with others. The Smart glove is made to bridge this gap of communication so that the voiceless people can communicate and feel included in more activities. The Smart glove is a normal, cloth driving glove fitted with flex sensors along the length of each

finger and the thumb. The flex sensors on the glove can help sense the movement and through this the command given would come as a pre-recorded voice simultaneously a speech output is play backed through speaker also Flex sensor, microcontroller are also used. This glove is made to lower the communication barrier between voiceless people and masses with the help of these gloves disabled person can also get chance to grow in their respective carrier. Thus with the help of this project, the barrier faced by these people in communicating with the society can be reduced to some extent. As we know sign language is not known by every person so this is an attempt through this project to lower the communication barrier to a small extent between a speech impaired person and a other person..

II.　AIM & OBJECTIVE

II.1. Objective

The objective of this research work include Basic object of this project is to design a portable embedded system Developing an economical and simple solution for the detection of finger gestures Cost effective, reliable data acquiring method The project focuses to design a smart gloves which can help speech impaired people to communicate and lower the communication barrier between them and a other people.

II.2.Aim

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The Aim of the project is to help the section of population who are speech impaired and have a communication barrier with the help of this project. This Smart glove can help them to interact and communicate with other people.

II.3.Literature Review

Various techniques used in latest to achieve the goals set out in

[1] Here Micro controller with ardino serve as the main control of the system. Flex sensor and accelerometer are use for detecting hand movements with LCD for message display with speaker for audio output. is seen that the project gives 83.50% accuracy also translates sign language to readable text. It has handIt gesture assigned with a phrase then the audio audio output is too given of both male and female voice.

[2] The bend sensor on each finger with accelerometer is placed on glove. Hall sensor on each finger with strong magnet. Here the accuracy is 96% . the hall sensor is less than 250 means it is off means finger are near the magnet and at 420 sensor are ON means finger are outstretched.

[3] Flex sensor, accelerometer, arduino, Bluetooth device with speaker is used. With the help of flex sensor and arduino we can have audio output by hand gesture The new this the bluetooth device the have used for carrying output from arduino to computer. But can be draining as you alwas need a display screen with you (computer/laptop/mobile).

[4] Here a Camera is Place On the brim of a cap To recognize hand gesture. Accelerometer is also used The project compares the result of training the result of training gesture vocabulary. Here accuracy is good. The project doesn't have speech output or text output.

II.4.Research Gap

As we know sign language is not known by every person so this is an attempt through this project to lower the communication barrier to a small extent between a speech impaired person and a other person. The device it has two problems such that the device size is huge and uncomfortable for regular use and it only reads and interprets letters of English language. Words, sentences and gestures are therefore not interpreted This is specifically the problem which the smart glove is designed so that not only alphabets but also words and sentences will be understood and translated along with the gesture.

III.   METHODOLOGY

The motive of the project is to design a sign language smart gloves, translator fitted with sensors that can help to interpret with 26 english letters in Sign language. Communication plays a important role in human day to day life it helps to communicate with emotions, thoughts and reactions which is understood by others. It is one of the aspects to develops relationships among others and to overcome the distance .It should have a common medium to deliver message and interpret, with modern technology have advance methods to communicate with countless innovations and inventions has been developed. Communication for peoples which are physically impaired or speech impairment has become a challenge for them to communicate in day to day routine. For sign languages different methods have been approached in the past for the recognition, most of them are based on flex sensors, wearable conductive optical cable, strain gauge EMG (Electromyography, MMG(Mechanomyogram), Detoriation of fibre optic cable. In this project we have used two types of sensors which are flux sensor and accelerometer. The flex sensor used are resistive carbon parts ,generally the globalized value of flexible device is 10kohm resistance and when it is bent its resistance increases 30 to 35 kohm at an angle of 90°.In this circuit a potential divider is employed to pass the output voltage across 2 resistor which are connected in non-parallel .As the flux sensor is bend - smaller the radius it gives higher value of resistance. Accelerometer works as a tilting sensing element with Gesture Vocalized system ,it checks the hand movements(tilting).The accelerometer of PIC microcontroller having three outputs X,Y and Z positions. The hand movements of the palm can be captured by accelerometer in which Flex sensors can measure the movements(bend) of the fingers when making a sign language. When the a gesture is performed ,the sensor starts giving signals which are amplified through a dedicated amplification circuit to signal and then it is sense by the microcontroller which convert the Analog signal to digital signal (values) with the help of 8 channel ADC ,those values are set to form a state matrix having five values for each flex sensors for each axis of the accelerometer. The use of ADC gives easy interface to all microprocessors. The output is displayed on LCD. the formation of words and their output signal is obtained on LCD. If there is no Letter match with current state of hand gesture then no output is displayed on LCD. The flex sensors have pragmatical deflection of 0°,15°,20°,45°,60°,70°,90°, which gives different values of resistance as temperature changes. This paper have a review of different recognition and types of system involved in it. One such type of system is used for application and explained in this review. Smart glove is very helpful for deaf and dumb people to co-ordinate(interact)with each other and normal people. Disabled people also use of sign

languages which a normal person is unable to understand. This system helps the sign languages to convert into short messages which can be understood by the normal person easily and they can communicate with the normal person far away from distances. Thus a PIC microcontroller based device with major role of flux sensor based recognition is designed and the output of the system is displayed on the LCD.

a) Flex sensor: A flex sensor is a kind of sensor which will measure quantity of bending of deflection. Here in this project flex sensors are fixed to the exterior of the gloves. The flex sensor is like a thin strip which has some resistance in it which changes with the angle of bending of flex sensor.

b) Accelerometer: This project contains accelerometer and a gyroscope in a single chip This sensor is very accurate and it also contains 16 bit analog to digital conversion hardware for each channel. The presence of gyroscope along with the accelerometer makes it capable to capture x,y,z planes at same time.

c) ADC (analog to digital converter): The main purpose of this ADC is to convert the analog signal from accelerometer and flex sensor into a digital signal which could be read by microcontroller.

d) LCD display: A 16X2 LCD display is used to display the output. The output given by the microcontroller is displayed on this 16X2 LCD display.

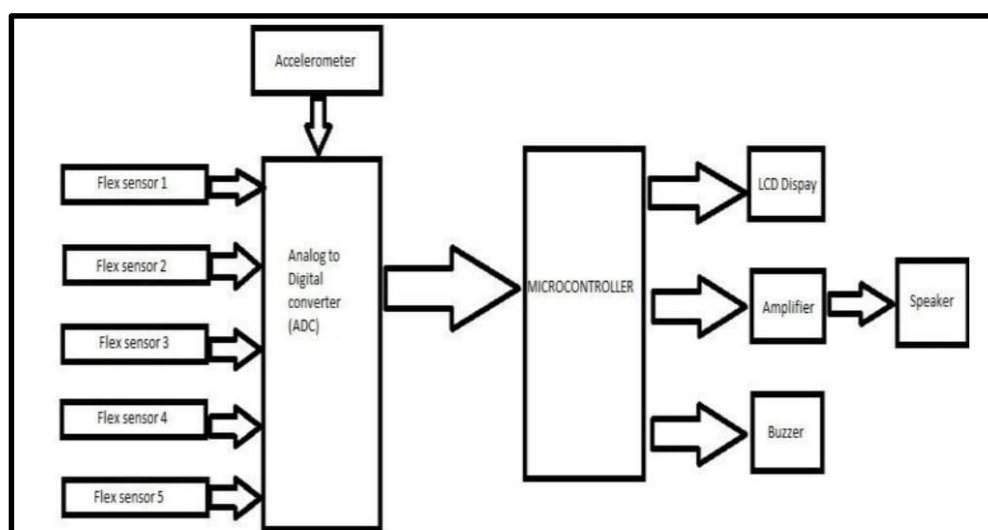## IV.   FIGURES AND TABLES

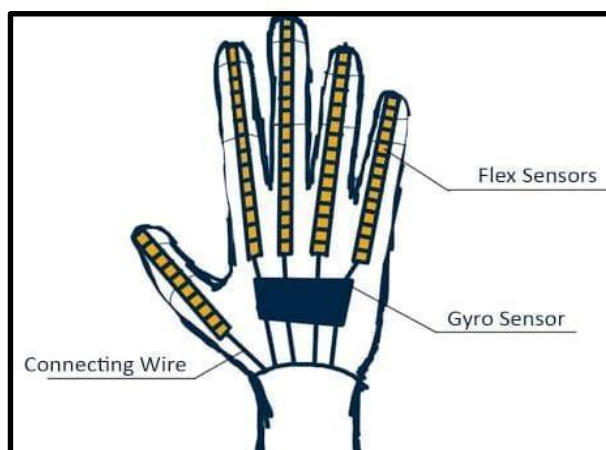Fig 1 Block Diagram of Smart Glove

Fig 2 Basic concept of smart gloves

V.   CONCLUSION

Sign language is a means of communication with a person with a disability. Here we translate sign language into text and speech so that communication is not limited to you, eliminating the use of data gloves and the barrier of communication between two different communities. Using data gloves a disabled person can re-grow in his or her position and make the nation grow as the percentage of people with disabilities is estimated at millions. To make their future better and to make the nation better.

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