

Smart Gloves 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 sensor 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 gloves .

I. INTRODUCTION

In India around 1 percent of population are deaf and dumb, as the main obstacle they face is communicating with people.

The only medium through which we can easily coordinate with human being is communication which helps us to convey our thoughts and messages easily, especially for deaf and dumb people's

As speech impaired person uses sign language to communicate, most of the people don't understand sign language here so with the help of these glove people can also try communicate with them and the voiceless people can also feel included in activities. We can bridge this gap with the help of this Smart Glove, a mute/voiceless person can communicate with the Smart Glove that will convert the Hand Gesture to movements into text and pre recorded voice.

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 work aims to lower this barrier in communication between the voiceless and the masses. Smart Gloves plays major role in the life of deaf and dumb people's, it can help them to make further career in fields of the rechoice, through which they can express their thoughts and actions in their particular field with the help of smart gloves. Thus with the help of this project, the barrier faced by these people communicating with the society can be reduced to a great extent. As we know sign language is not known by every person this is an attempt through this project to lower the communication barrier to a small extent between a speech impaired person and another person.

II. BLOCK DIAGRAM

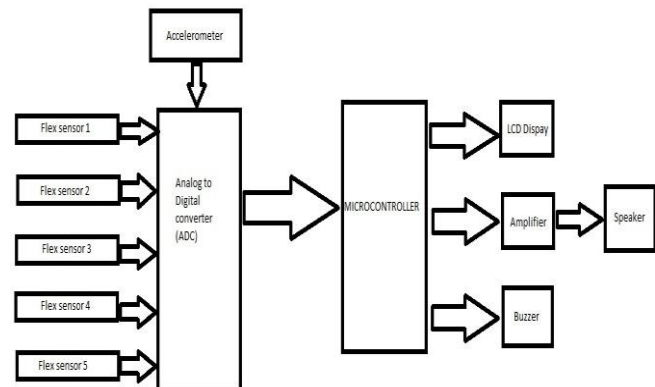


fig 1 Block diagram of smart glove for deaf and dumb people

a) Flex sensor: A flex sensor is a kind of sensor which will measure quantity of bending or 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 an 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 a gyroscope along with the accelerometer makes it capable to capture x, y, z planes at the 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

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. Sign language is the universal tool for the hearing and speech impaired peoples. For sign languages different methods have been approached in the past for the recognition, most of them are based on flex sensors, wearable conductive fibre, sliding fibre optical cable, strain gauge tactical sensor, 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 the resistance will increase to 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 pragmatcal 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.

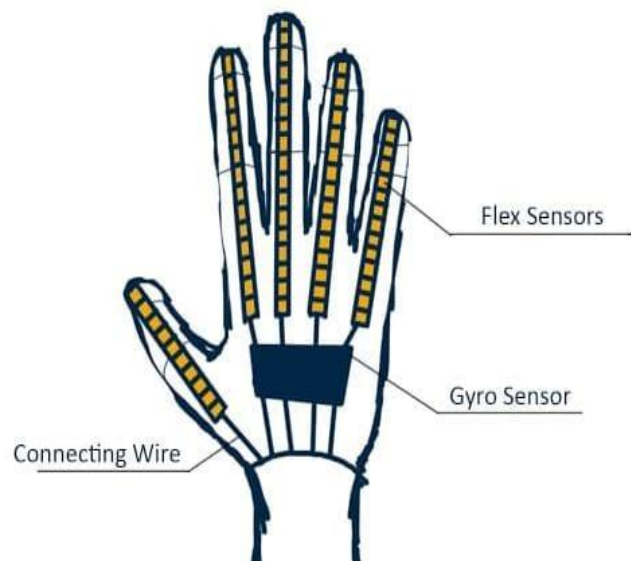


Fig 2 Basic concept of smart gloves

IV. CONCLUSION

It can help to lower the communication barrier between a mute person and the masses. Also it would be helpful in educational and health issues related to deaf and dumb people. It can also be useful for their daily jobs.

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