IMPLEMENTATION OF GLOVE FOR DISABLED PEOPLE

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ABSTRACT

The mute community around the globe has a hard time communicating with the rest of the world's population. This communication gap is there because a dumb person uses sign language which is not comprehensible by a normal person. This project mainly focuses on removing the barrier of communication between the mute community and the people not familiar with the concept of sign language so that the messages that a dumb person is trying to relay is understandable to a person with no knowledge of sign language. The design of the device is based on embedded systems. Gesture Sensor, Bluetooth and Arduino are the key components.

Keywords: *Arduino, Gesture Sensor, Bluetooth.*

INTRODUCTION

A person with speaking disability faces difficulty in communicating with the rest of the population. This device is developed to improve the lifestyle of a person who has speaking disability. This device converts the gesture to speech i.e., gives voice to a mute person. Speech is one of the important factors required for the humans to convey their messages. In this project, Flex sensors play the major role. They are stitched to the gloves. The output from the flex sensors is fed into the Arduino development board. Arduino converts the analog signal to digital by Using ADC and then displays the output on the android app via Bluetooth.

LITERATURE REVIEW

B. G. Lee and S. M. Lee [1]: Gesturing is an instinctive way of communication to present a specific meaning or intent. In this paper, sign language interpretation system using a wearable hand glove is proposed. This wearable system uses five flex-sensors, two pressure sensors, and a three-axis inertial motion sensor to differentiate the characters in the American Sign Language alphabet. The whole system consists of three units: a wearable device with a sensor module, a processing module and a display unit mobile application module. Mobiles that are based on android application were developed with a text-to-voice function that converts the received text into audible output.

P Vijayalakshmi; M Aarthi The aim behind this work is to develop a system for recognizing the sign language, which provides communication between people with speech impairment and normal people, thereby reducing the communication gap between them. Compared to other gestures (arm, face, head and body), hand gesture plays an important role, as it expresses the user's views in less time. In the current work flex sensor-based gesture recognition module is developed to recognize English alphabets and few words and a Text-to-Speech synthesizer based on HMM is built to convert the corresponding text.

Jinsu Kunjumon; Rajesh Kannan Megalingam The proposed system will recognize Indian Sign language and convert it into speech and text in 2 languages English and Malayalam and display it on Android phone.

T. Shanableh for recognizing isolated Arabic sign language gestures in a user independent mode. In this method the signers wore gloves to simplify the process of segmenting out the hands of the signer via colour segmentation. The effectiveness of the proposed user-independent feature extraction scheme was assessed by two different classification techniques; namely, K-NN and polynomial networks. Many researchers utilized special devices to recognize the Sign Language.

EXISTING METHOD

Two traditional ways of communication between deaf person and hearing individuals who do not know sign language exist through interpreters or text writing. The interpreters are very expensive for daily conversations and their involvement will result in a loss of privacy and independence of a dumb person. Thus, a low-cost, more efficient way of enabling.

DISADVANTAGES

1. Only writing on notes can convey the messages.
2. No automatic sensing of gestures.
3. Uncomfortable to understand if the other people don’t know the Sign Language.

PROPOSED METHOD

In this proposed system flex sensor is implemented to capture the hand gestures of a user. The flex sensors output a stream of data that varies with degree of bend. Five bend sensors are placed on a glove, four for the fingers and one for the thumb. These sensors measure the bend in the fingers and thumb and palm and according to the bend angle value the Arduino Nano microcontroller understands which set of value represent which symbol and transfer the appropriate outcome value to the Android app via Bluetooth which displays and speaks the symbol generated.

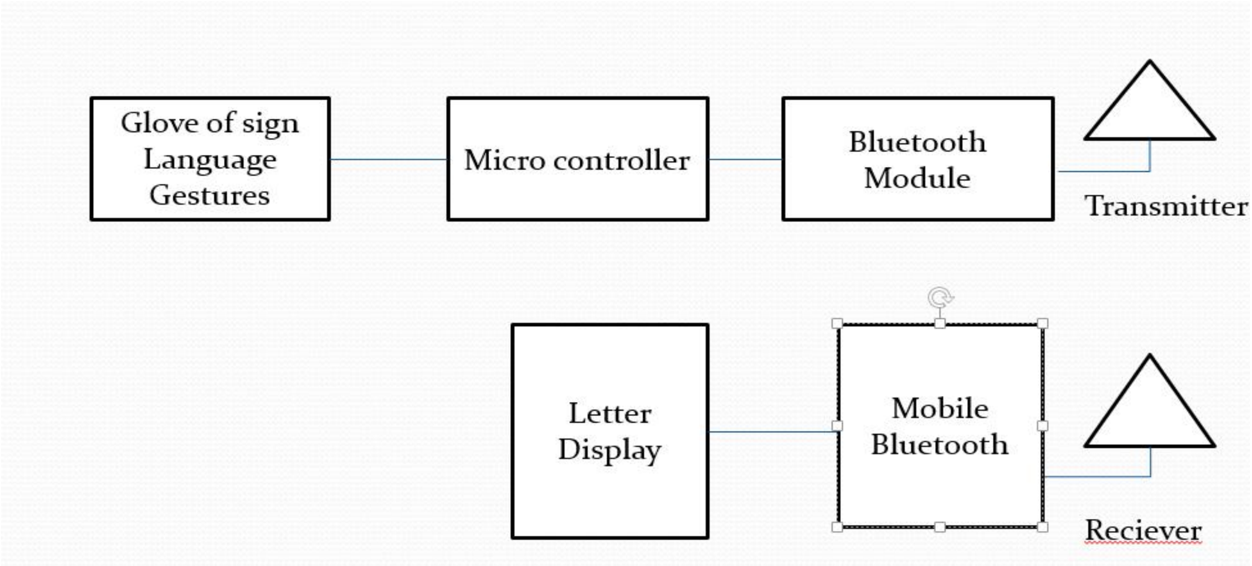

Fig 1: Flow diagram

METHODS OR TECHNIQUES USED

In this we are using Arduino and flex sensors. The flex sensors are connected to the glove and based on the gesture the flex sensors sends the data to the arduino and arduino process the data and sends to the bluetooth and then displays the output on the android app.

SIMULATION RESULT

INPUT1:

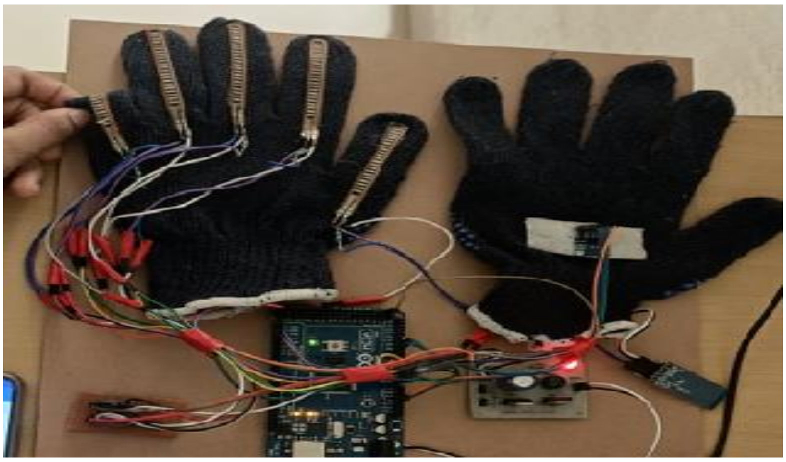

Fig 2: Holded the last finger of left glove

When we bend the last flex sensor i.e., flex sensor 5 it detect the maximum range of the flex sensor and produces the output.

OUTPUT1:

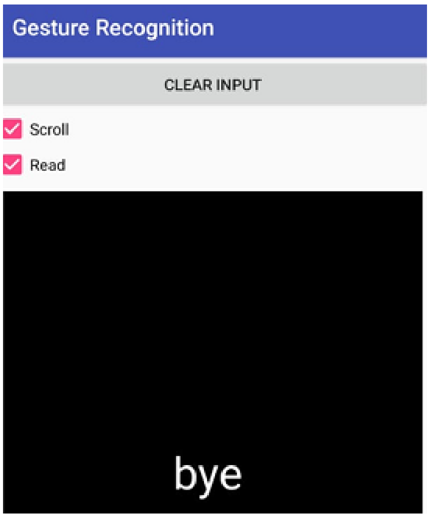

Fig 3: Output bye is displayed in the android app when we bend the last flex sensor

INPUT2:

Fig 4: Moved the right glove towards down

When we move the glove down the memssensor detect the glove in the negative y direction and displays the output which should be displayed when moved towards negative y direction

OUTPUT2:

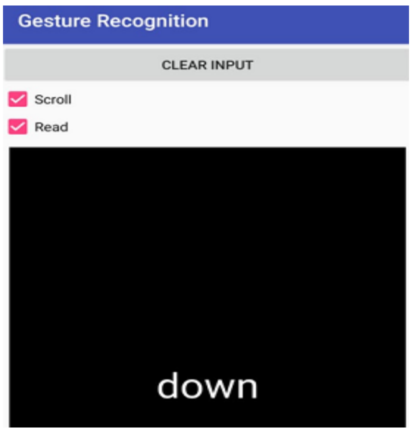

Fig 5: Output bye is displayed in the android app when the memssensor is moved in negative y direction

INPUT3:

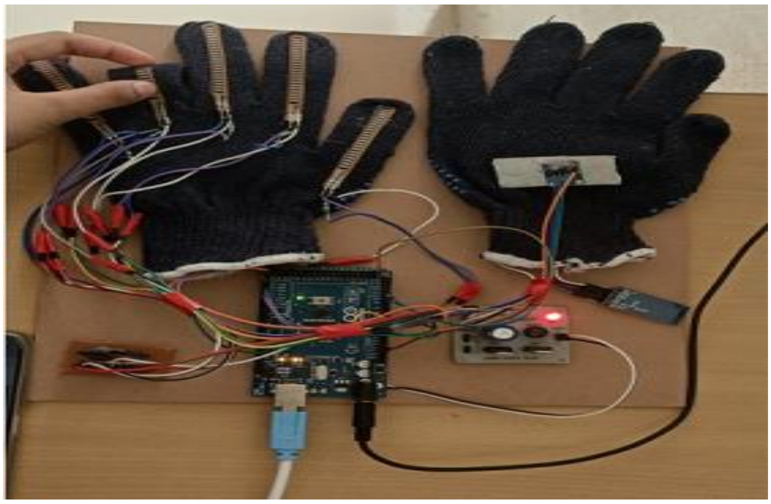

Fig 6: Holded the fourth finger of left glove

When we bend the fourth flex sensor i.e., flex sensor 4 it detect the maximum range of the flex sensor and produces the output.

OUTPUT3:

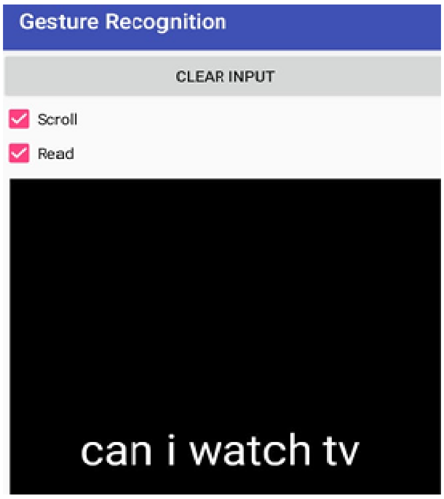

Fig 7: Output bye is displayed in the android app when we bend the last flex sensor

ADVANTAGES

1. Low-Cost Compact Systems.
2. Flexible To Users.
3. It Takes Less Power to Operate System.

APPLICATIONS

1. Gesture Recognition and Conversion.
2. As A Translating Device for Mute People.

CONCLUSION

As a final remark, the progress made in the development of the glove prototype. Although it is not a finished product, it shows that using a glove outfitted with sensors, a microcontroller, and wireless communications can be used to translate signs. It satisfies all of the major requirements, and it may lead to further developments in translation devices. With increased attention to the challenge of sign language translation, by this technology the communication gap between sign language users and the hearing may soon be diminished. The completion of this prototype suggests that sensor gloves can be used for practical sign language recognition. More sensor can be employed to recognize full sign language.

FUTURE SCOPE

This tool can be:

1) Further integrated with various services and help to generate employment for the deaf and dumb people.

2) Geared up with the controller to provide home automation on finger tips.

3) Paired up with fitness sensor to monitor health of the individual**.**

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