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Hand Gesture Recognition and Voice Conversion for Deaf and Dumb Using Hand Glove

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ABSTRACT: Generally deaf-dumb people use sign language for communication, but they find difficulty in communicating with others who don't understand sign language. Due to which communications between deaf-mute and a normal person have always been a challenging task. We propose to develop a device which can convert the hand gestures of a deaf-mute person into speech. This methodology provides a map for developing a digital wireless glove which is fitted with Flex sensors. These sensors sense the gestures of a person in the form of bend of fingers and tilt of the hand fist. This system includes a voice playback IC to give the real time speech output in regional language as well as a LCD module to display the text. The text display being in English, the voice output of this device will be in regional language. So this device acts as a communicator as well as a translator providing more flexibility in communication. The gesture sign also controlled the home appliances using relay.

KEYWORDS: GDP, Google play store

I. INTRODUCTION

Humans communicate with each other by conveying their ideas, thoughts, and experiences to the people around them. There are numerous ways to achieve this and the best one among all is the gift of "Speech". The only means of communication for deaf and dumb people is the "Sign Language". It will be injustice if we ignore those who are deprived of this invaluable gift. Deaf- Dumb people need to communicate with normal people for their daily routine. There are some difficulties when they come across in certain areas like banking, hospital. India constitutes 2.4 million of Deaf and Dumb population. These people lack the amenities which a normal person should own a survey analysis. This decreasing ratio of Literate and Employed Deaf and Dumb population is a result of the physical disability of hearing for deaf people and disability of speaking for dumb people so it yields to lack of communication between normal person and Deaf and Dumb Person.

It actually becomes the same problem of two persons which knows two different language, no one of them knows any common language so its becomes a problem to talk with each other and so they requires a translator physically which may not be always convenient to arrange and this same kind of problem occurs in between the Normal Person and the Deaf person or the Normal Person and the dumb person. To overcome this problem, we introduce a unique application. Our application Model is a desirable Interpreter which translates sign language to synthesized text and voice. Gesture recognition is mainly categorized into vision-based approach and Haptic-based approach. The vision based approach captures the movement of the signer's hand using cameras, on the other hand, haptic-based approach deals with instrumented gloves affixed with measurement devices which track hand movements. Owing to large data and complex computation involved in vision-based approach, this paper specifically deals with Haptic-based

This paper focus on developing a help for disabled people using this gesture recognition technique. In this system the gestures are converted into text messages for communication. A number of techniques are used to convert these gestures into required output, typically either image based or device based, although hybrids are beginning to come about.

II. PRAPOSED WORK

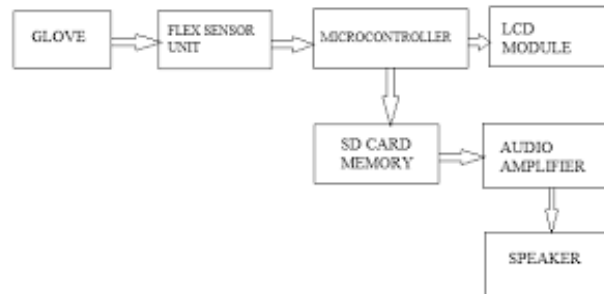


Figure 2.1: Block Daigram of System;

In this project data glove is implemented to capture the hand gestures of a user. The data glove is fitted with flex sensors along the length of each finger and the thumb. The flex sensors output a stream of data that varies with degree of bend.

Figure illustrates the proposed system architecture; the system is mainly composed of several modules including the flex sensors, ARM 7 microcontroller, LCD, SD card, Audio amplifier and speaker. The first module (input) acquires signs performed by a dumb person communicating with the system using sign language; Flex sensors outputs data stream depending on the degree and amount of bend produced by the sign. A set of signs that represent words are collected as the data base for this system. The output data stream from the flex sensor is fed to ARM 7 Microcontroller where it is processed and converted into digital form. The analog outputs from the sensors are then fed to the inbuilt ADC of the ARM 7 microcontroller. These analog readings are then digitized and stored in internal RAM memory of microcontroller. The microcontroller will compare these readings to the look up table stored in internal program memory, whichever reading is closest to the look up table microcontroller will select that word. After this microcontroller will search the SD card for .wav file with similar name. That text will be displayed on LCD and played out via speaker. By using this wearable data gloves mute person can easily communicate with normal people.

2.1: ALGORITHM USED:

- Stage 1: The data glove is fitted with flex sensors along the length of each finger and the thumb. The flex sensors output a stream of data that varies with degree of bend
- Stage 2: Flex sensors outputs data stream depending on the degree and amount of bend produced by the sign. A group of signs that represent words are collected as the data set for this system.
- Stage 3: The output data stream from the flex sensor is fed to ARM 7 Microcontroller where it is processed and converted into digital form.
- Stage 4: The microcontroller will compare these readings to the look up table stored in internal program memory, whichever reading is closest to the look up table microcontroller will select that word.
- Stage 5: After this microcontroller will search the SD card for .wav file with similar name.
- Stage 6: That text will be displayed on LCD and played out via speaker.

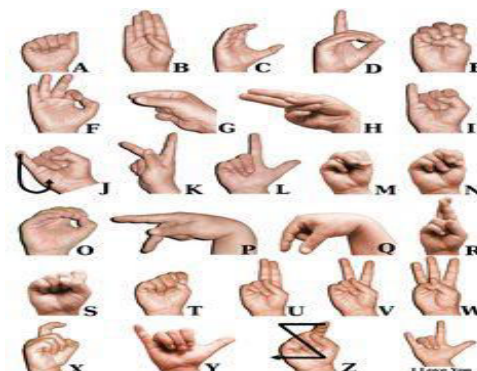


Figure2.1: Equivalent English Cue Symbols For Database:

III. FLEX SENSOR

The Flex Sensors are analog variable resistors, they works as variable analog voltage dividers. They are usually in the form of a thin strip having length 1”-5” width 0.25”and thickness upto 0.19”, they can be made uni-directional or bi-directional, as the size changes according to that resistance varies. The Flex Sensors are mounted on each finger and thumb of the glove. These are fitted on the fingers by using threads and needle. Flex sensor basically made up of carbon resistive elements, which have greater form factor on a thin flexible substrate, more carbon means less resistance. When the substrate is bent, the sensor produces a resistance output correlated to the bend radius—the smaller the radius, the higher the resistance value. In this way flex sensor offers variable resistance readings.

Flex sensor operate at 5-volt input voltage d output between 0 and 5 V, resistivity varying with the sensor’s degree of bend and the voltage output changing accordingly. The sensors connect to the device via three pin connectors. The flex sensor pictured below changes resistance when bent. It will only change, the resistance increases to 30- 40 kilo ohms at 90 degrees.

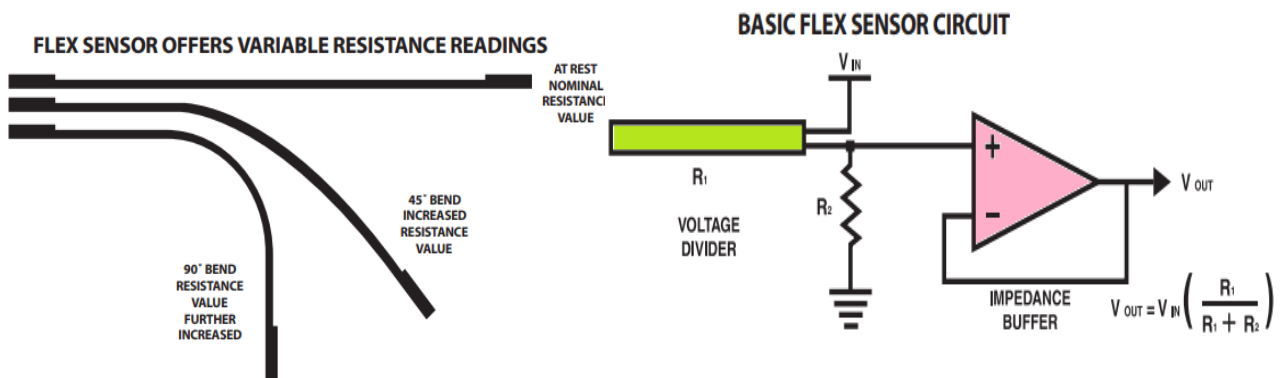


Figure 3.1: Basic Flex Sensor & Resistance Reading

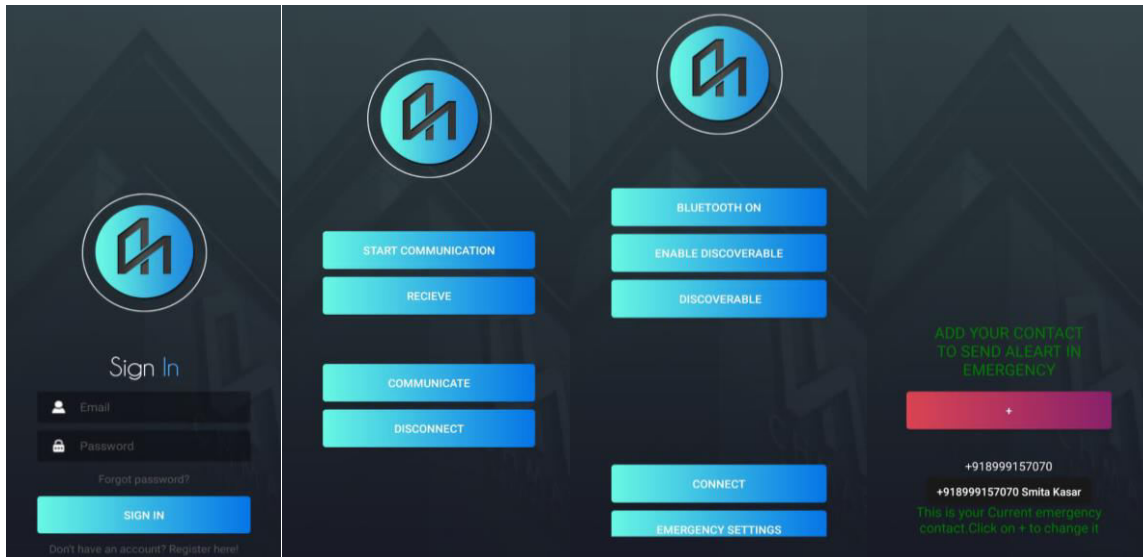
3.1. ADVANTAGES:

- Low cost
- Compact systems
- Flexible to users
- It takes less power to operate system

3.2 APPLICATIONS:

- Gesture recognition and conversion
- As a translating device for Mute people.

IV. WORKFLOW OF OUR SYSTEM



V. FUTURE SCOPE

The completion of this project suggests that these wired gloves can be used for partial sign language recognition. In future work of this proposed system supporting more number of signs and different language mode. One can make this system wireless so that it becomes handy and portable for commercial use.

VI. CONCLUSION

Sign language is a useful tool to ease the communication between the deaf or mute community and the normal people. Yet there is a communication barrier between these communities with normal people. This project aims to lower the communication gap between the deaf or mute community and the normal world. This project was meant to be a prototype to check the feasibility of recognizing sign language using sensor gloves. With this project the deaf or mute people can use the gloves to perform sign language and it will be converted into speech so that normal people can easily understand.

REFERENCES

- [1] Sachin Bhat, Amrutash M, Chidanand Das, Sujith "Translating Indian Sign Language to Text and Voice messages using Flex Sensor". International journal of advanced research in computer and communication Engineering, vol 4, Issue 5, MAY 2015.
- [2] Priyanka R.Potdar, DR.D.M.Yadav "Innovative Approach for Gesture to Voice Conversion :Review", International journal of innovative research and development ,vol 3, Issue 6, June 2014.
- [3] Mr. Prashant Chandhari, Prof. G.R.Phulay, Mr. Ravindra Patil "A Review on Hand Gesture Recognition System" , International journal of Advanced Research in Computer Engineering and Technology, Vol 2, Issue 1, Jan 2013.
- [4] Mr.M.V.N.R.P.Kumar, Mr Ashutosh Kumar , Mr.S.B.Arawandekar, Mr.A. A Bhosale, Mr.R.L.Bhosale "AVR Based Gesture Vocalizer Using Speech Synthesizer IC", International journal of Research in Advent Technology, vol 3, issue 5, May 2015.
- [5] "Deaf-Mute Communication Interpreter" by Anbarasi Rajamohan, Hemavathy R., Dhanalakshmi M. International Journal of Scientific Engineering and Technology (ISSN : 2277-1581) Volume 2 Issue 5, pp : 336-341, 1 May 2013
- [6] G. Potamianos, C. Neti, G. Gravier, A. Garg, and A.W. Senior, "Recent advances in the automatic recognition of audiovisual speech," in Proceedings of the IEEE, vol. 91, Issue 9, pp. 1306-1326, 2003.
- [7] P. Heracleous, N. Aboutabit, and D. Beutemps, "Lip shape and hand position fusion for automatic vowel recognition in cued speech for French," IEEE Signal Processing Letters, vol. 16, Issue 5, pp. 339- 342, 2009.



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