A GLOVE THAT TRANSLATES SIGN LANGUAGE INTO TEXT AND SPEECH

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ABSTRACT

In India about 6 million people are suffering from speech impairment and hail impairment. People with speech impairment use sign languages to communicate with the society which is delicate for normal people to understand. Therefore communication between deaf-mute people and normal people had always been a grueling task each over the world. Hence deaf mute communication needed practitioner who'll convert hand gestures into audile speech. In past this design perpetration involved the use of image processing conception and accelerometer. But the debit of these executions are systems were non movable and too precious. Thus this system is being proposed with the use of flex detectors and accelerometer. Smart Glove for Subscribe Language Translation is a work that aims to present an easy way of communication for speech bloodied and hearing disabled people. Which makes the communication between speech and the normal people easy and also helps them in emergency situations.

1. INTRODUCTION

India constitutes around 2.4 million of Deaf and Dumb population. These people lack the amenities which a normal person should own. This decreasing ratio of Literate and Employed Deaf and Dumb point 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 hand Glove Our Model is a desirable Interpreter which translates sign language to text and then into voice. All

beings on earth have settled means in which to carry their emotions and thoughts to one another. The severe issue for the deaf and dumb civic is obviously the trouble in communicating with vocal people.

These people communicate via sign language; however, the main subject is that the majority of people are not aware with sign language and they are not ready to learn this language. This created an idea to propose this project in which it will drastically facilitate and advance a communication method between the non vocal and vocal individuals. The wireless data gloves is used which is normal gloves fitted with Flex sensors along the length of each finger. Mute people can used the gloves to perform hand gesture and it will be converted into speech so that normal people can understand their expression. A gesture in a sign language particular movement of the hands with a specific shape made out of them.

2. LITERATURE SURVEY

In this system of converting gesture to text and speech, flex sensors are used which will be fitted to the fingers of the glove which gives a condition when bends that would be encrypted in the source code. With this system the communication among the normal and the deaf and dumb people would be made easy. The STM 32 microcontroller is also used along with Apr33A3 record and

playback module for the speech conversion. Bluetooth HC-05 does the part of showing up the text in mobile app using STM 32 bluepill Arduino IDE software.

The proposed ISLR system is considered as a pattern recognition fashion that has two important modules feature birth and bracket. The common use of Discrete Wavelet Transform (DWT) grounded point birth and nearest neighbour classifier is used to fete the sign language. The experimental results show that the proposed hand gesture recognition system achieves maximum 99.23 bracket delicacy while using cosine distance classified.

In this paper authors presented a scheme using a data base driven hand gesture recognition grounded upon skin color model approach and thresholding approach along with an effective template matching with can be effectively used for mortal robotics operations and analogous other operations. Originally, hand region is segmented by applying skin color model in YCbCr color space. In the coming stage thresholding is applied to separate frontward ground and background. Eventually, template grounded matching fashion is developed using Star Element Analysis (PCA) for recognition.

This paper, off- line hand recognition & verification using In neural network is proposed, where the hand is captured and presented to the stoner in a image format.

In this paper author proposed a system to prop communication of deaf and

dumb people communication using Indian sign language (ISL) with normal people where hand gestures will be converted into applicable textbook communication. Main ideal is to design an algorithm to convert dynamic gesture to textbook at real time. Eventually after testing is done the system will be enforced on android platform and will be available as an operation for smart phone and tablet pc.

Development of sign language grounded on homemade communication and body language. Subscribe language recognition system generally elaborate three way pre processing, point birth and bracket. Bracket styles used for recognition are Neural Network (NN), Support Vector Machine (SVM), Hidden Markov Models (HMM), Scale Invariant Feature Transform (SIFT), etc.

3. EXISTING SYSTEM

As we see in our surroundings their do exist specially abled people with disability in speaking and hearing, normal people do face difficulty in understanding what they wanted to convey. Normal people need to learn the sign/gesture language in order to understand what the people are saying or to say them something they wanted to. So, in-order to overcome such drawbacks and making it easy to understand or convey this glove idea is being proposed, which coverts sign/gesture to voice and text.

That becomes a hectic task that everyone to learn the gesture language and communicate with these people. Although that will be used to friends and family but in emergency situations it would always be a drawback.

However, in today's busy lifestyle not every one are ready to spend time on learning a new language to communicate with single person. Although it becomes necessary for the family and friends to learn it but for a stranger its completely not needed and can not make an unknown to help the deaf or dumb in emergency situations are in case of normal person. And also in the case of the people who knew the gesture language these can also communicate only when are face-to-face or else its not possible to communicate or to know their problem at an emergency.

4. PROPOSED SYSTEM

This proposed system was inspired with the idea of controlling robotic arm with the help of hand movements. Utmost of the working is same but enforcing the remaining part is rather a complex task. Accelerometer is used to measure the cock in the win. four bend detectors are placed on a glove, four for the fritters. These detectors measure the bend in the fritters according to the bend angle value. The stm32 microcontroller understands which set of value represent which condition and transfer the applicable outgrowth value to the Android app via Bluetooth which displays and speaks the symbol generated.

The earlier prototype failed drastically to represent the same but the problem was answered using a metallic strip between the cutlet, which was used to tell if they're in contact or not.

The delicacy was increased by continuously streamlining the data set for each symbol from time to time. Here as we see not only alphabets some emergency conditions such as need of water or an instinct of danger can be given as conditions. Such that if a detector bends a certain condition would be displayed in the app and also can be spoken out at the instinct. This system helps to easily communicate irrespective of the person is face to face or far away. Hence with a simple gesture the specially abled people can communicate with the normal people and vice versa irrespective of them knowing the sign language.
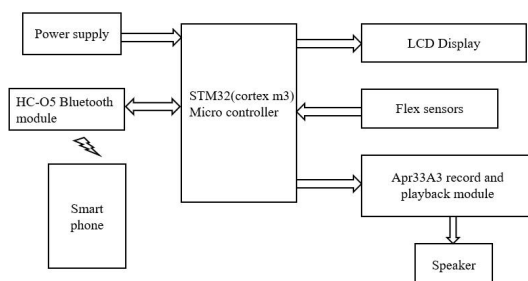
5. BLOCK DIAGRAM

Fig. 1 Block diagram

6. HARDWARE USED:

6.1 STM 32 ARM CORTEX M3:

STM32F103C8T6 is a very powerful Microcontroller and with its 32-bit CPU, it can easily beat Arduino UNO in performance. As an added bonus, you can easily program this board using your Arduino IDE (although with some tweaks and additional programmer i.e. USB to U(S)ART converter).
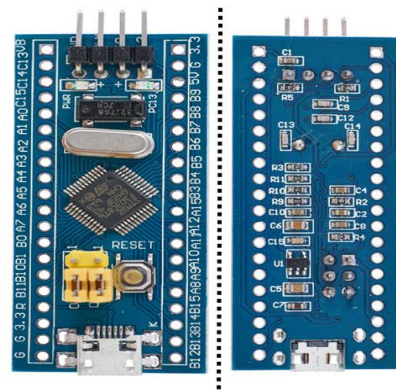

Fig. 2 STM 32

6.2 HC-05 BLUETOOTH MODULE:

Bluetooth is a small power wireless radio communication to link devices and to transmit data. The Bluetooth is a little microchip that works in a band of accessible recurrence all through the world.

Bluetooth HC-05 features:

- Sensitivity (Bit error rate) can reach -80dBm.
- The change range of output's power: -4 - +6dBm
- Has a built-in 2.4GHz antenna; the user needn't test antenna.

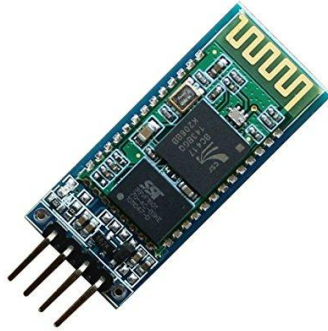- 2.4GHz digital wireless transceiver.

Fig. 3 HC-05 Bluetooth module

6.3 LCD Display:

LCD stands for Liquid Crystal Display LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs)

Fig. 4 LCD Display

6.4 APR33A3 RECORD AND PLAYBACK MODULE:

APR33A3 is a 8 Channel Voice Record & Audio Playback Board integrated with

APR33A series IC which is a powerful audio processor along with high-performance audio analog-to-digital converters (ADCs) and digital-to-analog converters (DACs). We will learn how to use this module, i.e. recording of Audio and playing it back again.
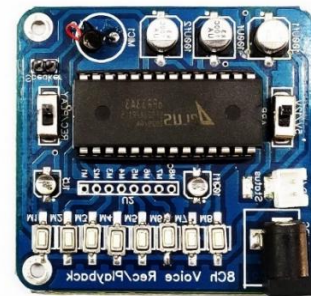

Fig. 5 Apr33A3 record and playback module

6.5 FLEX SENSOR:

A flex sensor is basically a variable resistor, whose resistance varies when bent. Because the resistance is directly proportional to the amount of bending, it is often referred to as a Flexible Potentiometer. Flex sensors are typically available in two sizes: 2.2″ (5.588cm) long and 4.5″ (11.43cm) long.

Fig. 6 Flex sensor

7. CONCLUSION

The main hedge coming between the commerce of deaf & dumb community and the normal persons is how to communicate each other's sentiments and feelings. It's needed for both the parties to have a deep knowledge of sign language. In utmost of the cases, it's seen that the deaf & dumb community has sign language as their rescuer but the normal persons face the difficulty in understanding them. In this paper, we reviewed multitudinous attempts and inductions taken by different persons to overcome this social issue. Gloves were made using flex detectors, accelerometers, image processing and numerous other sense were enforced but each had some or the other debit. To take into account total of the sign language, a huge library of functions is needed which is a veritably tedious job in itself. Inquiries are still being made to construct new and cost effective ways to produce such a device which converts sign language to speech. In this context its very clear that this device is pretty much helpful to the deaf and dumb to communicate with normal people. For the normal people also it becomes easy to communicate with them and can help in emergency situations as the text will come in the smartphone too.

8. FUTURE SCOPE

This glove which translates gesture to voice and text is a great and a very much helpful idea which is making communication between the normal and deaf-dumb people much simpler. Although it's a helpful one but may be it cant be used in all circumstances which may be made possible further. Many ideas such as making the communication much simpler and bringing up new ideas for making them to share their views and feeling easily can be introduced in the future.

9. REFERENCES

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