HAND TALK ASSISTIVE TECHNOLOGY FOR DEAF AND MUTE PEOPLE

T G MONICA, D MALAVIKA, R KOWSALYA
(B.E UG students)
(SRM Valliammai Engineering college , Kattankulathur)

ABSTRACT

Interchanging the information by the deaf and dumb people had become very difficult now a days. To overcome this difficulty, the proposed technique is Hand Talk Assistive Technology. It consists of a Glove is a normal cloth lashing glove fixed with flex sensors is used.The output of sensor depends on thumb bending. The output is in analog form is transformed to digital value and the data is processed by the microcontroller. In the receiver side the data's will be collected and processed to respond in the voice by using loudspeaker or a mobile phone. Dumb people interfacing are difficult and it is a extremely challenging issue, however this happen to its cardinal social interest, and it is inherently more difficult. The project work based on an approach has been offered, which works properly for normal communication languages that are used in our day to day life. This approach consumes very less time thus that a real -time appreciation also easily achieved. In addition, it can easily achieve 100% of recognition ratio by this approach.

Keyword : - *flex sensor, hand gesture and speech output*

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1. INTRODUCTION

We know that communication plays an outstanding role in our human lives. An electronic glove is developed for deaf-mute communication interpreter system that helps out the deaf and dumb individuals to speak with dependability. In this project only 1 hand is employed .There are four flex detectors employed and every square measure fitted with length of every finger of glove. The hand gesture plays a key role. The microcontroller decodes the gestures. By the every specific gesture of the flex sensors, the Indian linguistic communication alphabets/letters square measure to be created off. The concatenation of letters to create words is finished in Controller. Message is shown in alphanumeric display and voice output is produced from speaker.

.1.1 EXISTING SYSTEM

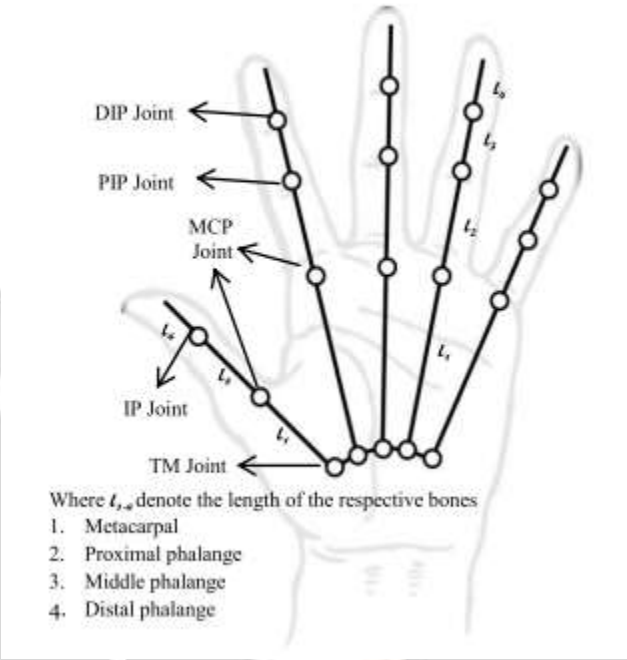
The existing system consists of a real-time working model of a hand glove attached with flex sensors. The hand gestures are read by the sensors and the RF signals are converted into outputs of various forms such as LCD display , DC motor control or any other electrical appliances control. It has also included the voice output from a speaker system with the help of a blue tooth module. This works only in a wired network.

1.2 PROPOSED SYSTEM

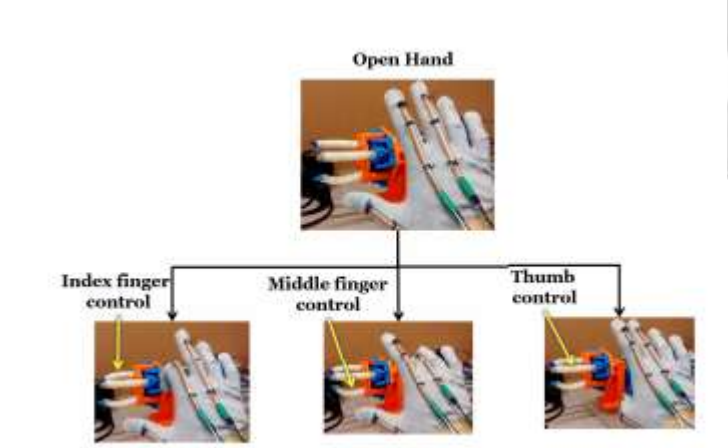
The existing system may have various disadvantages such as limited system usage, wired network etc., thus to overcome these difficulties, we launch a modified equipment that consists of a wearable hand glove with flex sensors built in, that read the thoughts of the deaf and dumb people via MRI scan and tend to load the thoughts in the database of the sensor for presenting the most relevant output that the patient wants to deliver to the other people. It also uses an android application that reduced the usage of the blue tooth module and connects directly to the kit to produce the output.

2. SYSTEM HARDWARE AND SOFTWARE

The proposed system consists of hardware materials such as cloth lashing glove , arduino board , accelerometer , flex sensors , connecting wires and software requirements such as arduino ide and a developed android application to get the voice output in the mobile. The fig 1 shows the various markings of the hand to read the gesture



The system can be made a wireless network with the usage of a battery built in , so that even when the person is in motion , he/she can use the device.



2.1 WORKING

The hand wearable glove has the hardware equipments placed on the top of the hand and the flex sensors attached to all the fingers. As the name implies , the flex sensors are very much flexible in bending and they can be twisted

front and back. When the flex sensors are bent by folding the fingers , the RF signal passes through the sensor so that it can be converted into a digital signal , that fetches the MRI database that work on the neural networks , and hence match to the related output and sends the output via a voice message . i.e that can be a statement.
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COMPARISON OF SIGN LANGUAGE RECOGNITION SYSTEMS

Author, Year	Interfaces	Methods	Language Level	AC (%)
Shukor, 2014 [2]	Glove, tilt sensors	Template matching	Alphabets Numbers Gestures	95.0 93.3 78.3
Sriram, 2013 [3]	Glove, accelerometer sensors	Template matching	Alphabets	Not mentioned
Matiwade, 2016 [4]	Glove, flex sensors	Logics level	Alphabets	Not mentioned
Goval, 2013 [5]	Images	Keypoint Localization	Alphabets	95.0
Murakami, 1991 [7]	Data glove, images	Neural networks	Alphabets Words	98.0
Patil, 2014 [15]	Glove, flex sensors	Template matching	Alphabets	Not mentioned
Lu, 2016 [17]	Glove, motion sensors	Extreme learning machine	Numbers	91.2 (highest)
Xie, 2015 [19]	Ring, motion sensors	Segmentation algorithm	Basic Gestures Complex Gestures	98.9 97.2
Hsu, 2015 [20]	Pen, inertial sensors	Min-max template	2D digits 3D digits 2D English character 3D gestures	99.4 94.6 94.3 93.0
Wu, 2015 [29]	Wrist-worn, sEMG, inertial sensor	LibSVM	Words	99.8 95.9

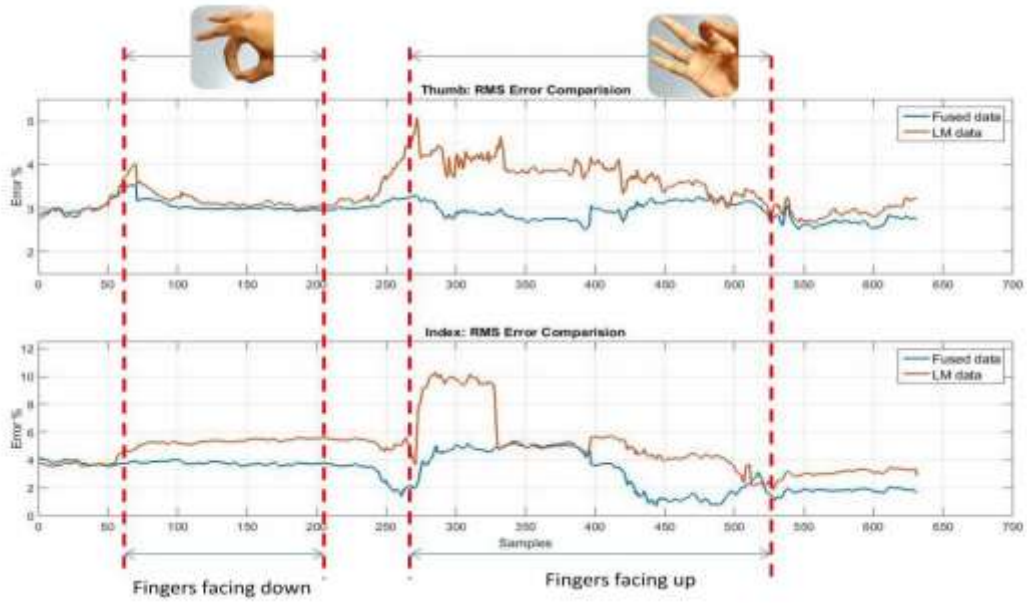
2.2 ALGORITHM EMPLOYED

The main algorithm that is employed over here is the support vector machine learning algorithm. The SVM algorithm can be used for classification and regression analysis. It divides the data that are gathered into various similar types and when required , it gives the categorized data. It can be used for matching the similar documents , hand language recognition , speech conversion etc., the system is also based on the following algorithms and programs

- Artificial intelligence
- Machine learning
- Embedded c language

3. GENERAL STRUCTURE

The fig 3 shows the conversion of RF signal into digital signal when the finger folding changes its position. Whenever there is a twist or folding in the fingers , the signal is generated. The accelerometer is used for finding the approximate bending of the flex sensors and can be used for giving the various combinations of output. The accelerometer has 3 varying positions X,Y,Z namely ,whenever there is a variation in the position of the accelerometer, the corresponding angle produces signal variation as shown in the fig.



3.1EXPERIMENT RESULTS

The experimental setup results in the form of voice output as statements from the android application developed. The system uses the hardware setup as well as the android application to produce the output when the flex sensors are bent or twisted. The system may give a series of combinations of output statements, that are likely to be conveyed by the deaf and dumb people.

4. CONCLUSIONS

The proposed system can be used in various fields such as robotics, military purposes, medical research etc., The system can be used not only for the deaf and dumb people but also for the parallelized and elderly people to convey their thoughts and get the help or assistance from the other people.

5. REFERENCES

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