Hand Glove To Translate Sign Language

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Abstract

This system describes talk able hand glove system which aims at translation of sign language to analyse text input and voice. This system consists of a talk able glove that can be worn by a deaf/dumb person to facilitate the communication in real-time with other people. The system translates the hand finger motion to corresponding letters using Contact switch sensors and an Arduino Board. Our main goal is to identify 26 alphabets and display text on the LCD. Once the text is obtained on the LCD then text to speech conversion operation is carried out and finally a voice output is obtained. Further, the text gain can also be viewed on a LCD or any portable hand held device. Our main aim is to set an interface between the Deaf or Dumb and normal people to improve the communication capabilities so that they can communicate handily with others. We mount contact switch sensor on the talk able hand glove and propose and efficient methodology to convert these sign languages with the help of Arduino UNO. This system will simplify the communication of deaf or dumb people with people able to normal communications without the need of a human translator.

Keywords: Arduino UNO, Contact switch Sensor, Hand Glove, LCD, Sign Language

I. INTRODUCTION

We propose a sensor glove which converts the mechanism of hand sign language used by hearing impaired into alphanumeric characters and finally gives a voice output, hence bridging the gap between them and the normal people. Communication which involves the exchange of information can only occur effectively if all participants use a common language. In addition to ensure that deaf people are able to obtain the best possible education and services within the community. We propose a device which will prevent the hearing impaired to be felt left out and can easily communicate with the normal people. The device in the form of a wearable hand glove which recognizes the Sign Language and converts it into text on any hand-held device and finally gives a voice output.

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.

II. LITERATURE SURVEY

   Speech and gestures are the manifest which commonly used in communication between human beings. In human communication, the use of speech and gestures is fully coordinated. A number of hardware techniques are used for rally information about body positioning. However getting the information is only the first step. The second step, that of recognizing the sign or gesture once it has been catch is much more challenging, especially in a continuous stream.

   The proposed method translates sign language to speech automatically and satisfy them by conveying thoughts on their own. The system overcomes the real time difficulties of dumb people and improve their lifestyle. System efficiency is improved with the help of PIC microcontroller and APR9600, also integrated with RF wireless transmission is help in long distance communication. By implementing this system speaking dream of dumb people becomes true compared with existing system its possible to carry to any places. We have currently developed more reliable and flexible system. Which manufacture at low
cost sign language translator for commercial purpose in future work of the proposed system supporting more no of sign and Different language mode.

3) Hand Gesture Recognition System: Swapnil D. Badgujar, Gourab Talukdar, Omkar Gondhalekar, Feb 2014:

The main goal of gesture recognition is to make a system which can identify specific human gestures and use them to demonstrate information for controlling devices and by implementing real-time gesture recognition a user can control a computer by doing a decided gesture in front of a video camera which is linked to the computer.

4) Data Gloves for Sign Language Recognition System: Priyanka Lokhande, Riya Prajapati: March 2015:

Sign language being the only communication means for Hearing impaired People community hampers their interaction with the normal people who lack the knowledge of sign language. This paper has the potential of minimizing this communication barrier by working as an automated translator and converting sign language directly into vocal and textual format for the understanding of normal people using various flex sensors, accelerometer, and ARM7 (LPC 2138). The input data glove detects the hand gesture done by the deaf-dumb person wearing it and provides the analog input to the microcontroller for further interpretation according to the database and the final output is observed on the LCD display and the speaker. Thus, hand gesture can be automatically converted with the help of this system into understandable form for the normal person.

5) Interactive Accelerometric Glove For Hearing Impaired: Kuldeep Singh Rajput, Shashank Deshpande, Uma Mudenagudi:

The main aim is to set an interface between the Hearing Impaired people and normal person to improve the communication efficiency so that they can communicate handily with others. We mount dual axis accelerometers on the glove and propose and efficient methodology to convert these sign languages.

III. SYSTEM ARCHITECTURE

These sensors are used to reduce the power and cost. It is used to detect the hand motion depends on the stress. And also it is easily embedded with any component or circuit. The hand motions are detected by the Contact Switch sensor and the values are stored on the Arduino unit. The output voices are previously stored on the voice processor unit. By using LCD the output will be displayed depends on the hand motions and also played through the speaker.

Fig. 1: Block Diagram

The contact switch sensor recognizes input gives it to the RF transmitter through Arduino UNO board for transmission. Then receiver receives it and sends back to Arduino board. Finally, the voice output be received through the speaker and text form of the output be displayed on the LCD.

IV. RESULTS AND DISCUSSIONS

The system has Contact switch sensor for detecting the hand motions. The sensor values are stored on the UNO board. Based on the hand motions the stored outputs are displayed on the LCD and also played through the speaker. Arduino specified language is used to write the program. Transmitter and receiver are used for transmission with the help of Arduino UNO Board. In this system is detect the hand motions in few seconds and also this system is got more accuracy.

V. HARDWARE

A. Contact Switch Sensor:

Contact sensors are those which require physical contact against other objects to trigger. A push button switch, limit switch or tactile bumper switch are all examples of contact sensors. Limit Switch These sensors are mostly used for obstacle avoidance.
robots. When these switches hit an obstacle, it triggers the robot to do a task, which can be reversing, turning, switching on a LED, Stopping etc. There are also capacitive contact sensors which react only to human touch (Not sure if they react to animals touch).

![Fig. 2: Contact Switch Sensor](image)

Touch screen Smart phones available these days use capacitive touch sensors (Not to be confused with older stylus based models). Contact Sensors can be easily implemented, but the drawback is that they require physical contact. In other words, your robot will not turn until it hits an object. A better alternative is to use a proximity sensor.

### B. Arduino UNO Board:

The Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.

![Fig. 3: Arduino UNO Board](image)

### VI. CONCLUSION

In this project describes the working principle of a system which is useful for deaf and dumb people to communicate with the normal people. The system has contact switch sensor for detecting the finger motions. The sensor values are stored on the board. Based on the hand motions the stored outputs are displayed on the LCD and same as play through the speaker.

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REFERENCES

[5] Interactive Accelerometric Glove For Hearing Impaired: Kuldeep Singh Rajput, Shashank Deshpande, Uma Mudanagudi: