Handicap Human Interaction Device

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Abstract— Communication between normal and handicapped person such as deaf people, dumb people, and blind people has always been a challenging task. Above portion shows the real communication between two societies. Our approach is important for deaf, dumb & blind person's decision-making and Human-Computer Interaction (HCI). It's a gift for a person who would like to learn language. It is useful for deaf, dumb & blind persons for their communication. The invention aims to facilitate people by means glove based deaf, dumb and blind communication interpreter system. The glove is internally equipped with flex sensor. For each specific gesture, the flex sensor produces a proportional change in resistance according to bending of finger of hand. The processing of these hand gestures is done in microcontroller. In addition, the system also includes a text to speech conversion block which translates the matched gestures i.e. text to voice output which help blind person during communication.

Key words: hand gestures, handicapped, Human-Computer Interaction (HCI)

I. INTRODUCTION

To establish a communication or interaction with deaf, dumb and blind people is utter importance nowadays .This people interact with sign or gesture. This sign convey some important message. By using sign it is easy for handicap person to communicate with normal person while many deaf persons communicate effectively using a form of sign language or the finger spelling alphabet, communication is even more difficult since they must be able to touch the hand of the person with whom they wish to interact. Consequently, the deaf dumb and blind avoid interacting with Person. These disabled individuals often remain unemployed and dependent, and cannot fully participate in community life. There are various signs which express complex meaning sand recognizing them is a challenging task for people who have no understanding for that language.

It becomes difficult finding a well experienced and educated translator for the sign language every time and everywhere but human-computer interaction system for this can be installed anywhere possible. The motivation for developing such helpful application came from the fact that it would prove to be of almost importance for socially aiding people and how it would help increasingly for social awareness as well. The remarkable ability of the human vision is the gesture recognition. It is noticeable mainly in deaf people when they communicating with each other via sign language and with hearing people as well. Sign language is a non-verbal form to the world.

The sign language doesn't have any origin so it is difficult to interrupt. The communication between deaf and mute can be done by using hand gesture to speech a gesture in a sign language is a particular movement of the hands with a specific shape made out of them. Facial expressions also count toward the gesture, at the same time. A posture on the other hand, is a static of the hand to indicate a sign. The sensor is divided into two point sensor and vision base. The disadvantage of vision based techniques includes complex algorithms for data processing Another challenge in image and video processing includes variant lighting conditions, backgrounds and field of view constraints and occlusion. The sensor base technique offers greater mobility.

The main aim of this invention is to convert sign language into voice and text a glove technique composing of flex sensor each hand gesture comprising of flex sensor. For each hand gesture made a signal is produced by the sensors corresponding to the hand sign the controller matches the gesture with pre-stored inputs. The device not only translates alphabets but can also form words using made gestures. Hence this problem solved by converting gesture signs into readable sentences and voice that can be easily understood by other people whether dumb/deaf/blind or normal human.

II. EVALUATION OF SIGN LANGUAGE

Evolution made language possible scores of millennia ago and there is no human community without it. What sign language teaches us is that humans have a natural propensity for language in two different modalities: vocal-auditory and manual-visual. Since the human ability to use language is so old, and since speech is the predominant medium for its transmission, it seems that spoken languages themselves are either also very old or are descended from other languages with a long history. But sign languages do not have the same histories as spoken languages because special conditions are required for them to arise and persevere, and for this reason they can offer unique insight into essential features of human language.

The first lesson sign language teaches us is that given a community of humans language inevitably emerges. While we have no direct evidence of the emergence of any spoken language we can get much closer to the origin of a sign language and inrare instances even watch it come into being. Another way in which a deaf social group and concomitant sign language can form is through the propagation of a genetic trait within a small village or town through consanguineous marriage. Resulting in a proportionately high incidence of deafness and the spread of the sign language among both deaf and hearing people.

Potentially this kind of situation can allow us to observe the genesis and development of a language in a natural community setting. Though the existence of such communities has been reported here and there (see especially Groce, 1985) no detailed linguistic study of a language arising in such a community has yet been provided. These are the ways in which sign languages happen. The existence of many sign languages around the

world the number 103 found in the Ethnologue database is probably an underestimate confirms the claim that the emergence of a highly structured communication system among humans is inevitable. If the oral-aural channel is unavailable, language springs forth in the manual-visual modality.

At the same time, the form and content of home sign are rudimentary and do not approach the richness and complexity of a language used by a community spoken or signed. This confronts us with another important piece of information: language as we know it is a social phenomenon. Although each brain possesses the potential for language, it takes more than one brain to create a complex linguistic system.

III. BLOCK DIAGRAM

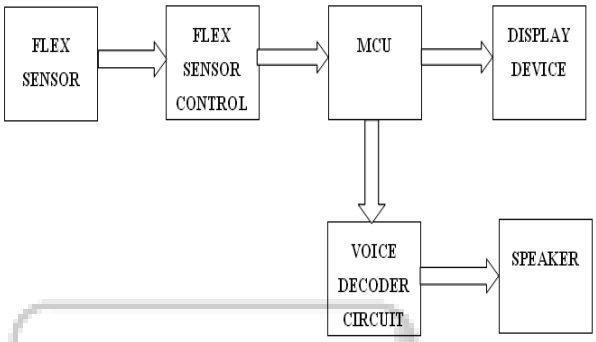

Fig. 1: Block diagram of handicap human interaction device.

IV. DESCRIPTION OF INVENTION

In this invention hope to make translation even easier with a cost-effective, efficient prototype that translates sign language into spoken language and spoken language into sign language in real time. A prototype system that understands the gestures of sign language and converts them to spoken and written language and vice versa.

The system captures a conversation from both sides: it displays the signer and renders a written and spoken translation of the sign language in real time and it also takes the non-signer's spoken words and turns them into accurate, understandable sign language. An avatar on the screen represents the non-signer and makes the appropriate sign languages gestures.

The flex sensor mounted on a hand glove. Then implemented the flex sensor circuit by using flex sensor and glove. Sensors are connected to a microcontroller to search a library of gestures and generate output signals on LCD that can be used to produce a synthesized voice or written text. The sensors transmit the data to the microcontroller to determine the shape, position and orientation of the hand relative to the body of the user. Microcontroller analyzed the data from the sensor to check whether a letter is being signed or not.

A. Flex Sensor

Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance the more the bend, the more the resistance value. They are usually in the form of a thin strip from 1”-5” long that vary in resistance. They can be uni-directional or bi-directional. The resistance range canvary from 1K-200K ohm. They are often used in gloves to sense finger movement. They work as variable analog voltage divider.

V. OUTCOME

A portable glove based sign language converter with LCD display which display a character and a different sign according to bending of fingers of hand and also convert the sign into speech through speaker.

VI. CONCLUSION

People who are born physically handicapped like deaf, dumb and blind person can never be treated forever life. But it way to educate them with many ways like visual education for deaf and dumb people, audio education for blind people. So, our inventions help them to educate, aware and entertain them in their way.

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