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Hand-Talk Assistive Technology for the Dumb

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Abstract— Nowadays deaf and dumb people have difficulty to face interchanging information with others who are not able to know the sign language. To overcome these difficulties, the proposed technique is Hand Talk Assistive Technology. It consists of a Glove is a normal cloth lashing glove fixed with flex sensors along the length of the every finger and thumb. The output of sensor is a group of data that varies with the degree of thumb bending. The output is in analog form is transformed to digital value and these digital data's are processed by the microcontroller. Then these datas are sending through wireless RF communication. In the receiver side the data's will be collected and processed to respond in the voice by using loudspeaker. 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 standing letters of Spanish Sign Language. 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 and the system will provide some feed-back message to signing person.

Keywords— Cardinal social interest, gesture recognition, Sign Language, flex sensors, recognition ratio

I. INTRODUCTION

Generally dumb people face difficulty for interchanging information with others without using sign language. Even though these people able to speak loud and usually have deaf voice of which they are insecure and that can build them restrained. In this work flex Sensors are playing important role. This type of sensors is modifying the resistance values depending on the appropriate value of bend of sensor reading. After they can convert the variation of bend to electrical resistance value. The bend is more, then the value resistance also more. Flex sensors are generally in the form of thin strip from 1to 5 inch long that change in resistance from in the order of 10 to 50 kilo ohms. It is used in gloves to sense the finger movements. Flex sensors are based on analog resistors [1]. It will work as a variable voltage divider circuit. Carbon resistive elements with a thin flexible substrate are present in the inner of the flex sensor. Here more carbon indicates very less value of resistance. Once the substrate is bent the sensor will produces a resistance output according to the radius of the bend. Typical flex sensors have a flex of 0 degrees will provide a 10K resistance and with a flex of 90 degrees will provide 30 to 40 Kilo ohms. The Bend Sensor provides resistance value of 30 to 250 kilo ohms. .The blind people can able to talk generously by means of usual language whereas it is not possible in the deaf people because they have their own language commonly say as sign -language. It is a form of non-verbal communication internally which was found in deaf people in all over the world. However there is no common origin for the languages and hence more complex to translate the information. Mute communication predictor is a tool that converts the hand gestures to audio voice message. In this a gesture in a sign language is a appropriate movement of the hand include different shapes made up of fingers [2]. At the same time, facial terms are also in use with the consideration of the gesture; on the other hand, it is a stationary form of the hand direction to illustrate a sign. The gesture recognition is categorized into two main groups. There are vision based technique and sensor based. The sensor based technique provides more mobility.

II. RELATED WORK

Today's world has greater technology that has always been of grand success to the disabled people and agreed them a serving hand to permit them to survive a usual and well life

similar to others. For this come up with a proposed idea of a glove named Hand talk assist technique that will translate the hand actions into text message and allow the dump to express them better. The proposed technique needs to be womb on the hand by the dump according to the variation of movements; the device will translate it cleverly into voice for the next person to understand it simply. This glove observes the movements via flex sensors pads and identify the various patterns of movements, the way of finger curls. The sensor can sense cautiously every resistance value and every actions made by person hand. Now the device can able to convert only little words however based on the success of the system. In future little more extra words may be included in this communicative method. The gestures can be converted to voice by using a APR 9600 voice storage and retrieval chip.

The Hand assistive glove was making by Ryan Patterson in the year 2001. He started his assignment with his own sign Language. This language translator made by two part of separate components. One is leather glove has ten flexible sensors which observe the location of the fingers by determining the electrical resistance produced by fingers as their appropriate bend. A small microcontroller placed on the back side of the hand modifies the change occur in electrical current means analog signal into digital signals. After that it will be transmitted through wireless to a personal computer. Then the computer read all the number values and change them into the alphabets which will come into view on the screen. The disadvantage of this method was that a computer was always necessary for its performance which is less portable. The Sayre Glove, formed by Electronic Visualization Laboratory in University of Illinois in 1977, it was the first glove [3]. One of the first commercial gloves was the Nintendo Power Glove in 1987. It was intended as a gaming glove used for the Nintendo Entertainment method. It will made up of a crude tracker and bend sensors, in addition buttons on the back side of the system. The sensors present in the Glove were in addition used by hobbyists to generate their individual data gloves [4]. We get this as an motivation for creating our individual data gloves with cheap equipments. The disadvantages of conventional method are Manual operation, Persons actions are difficult to understand, Conveying information to be take more time. The advantages of proposed work are good systematic approach, compact system, conveying information to others are easy, Easy way of sensing signal ,lower to barrier communication, flexible system.

Most of the researchers will have the same opinion that choosing the most suitable method for persons to learn disabilities and it needs a secure and organized plan [5]. The very important one is to stress that not every assistive technology is proper for all persons in most situations. However the people who learn the disabilities have their individual distinctive set of power, weak point, unique capability, interests, and knowledge. So there is no such "common function" assistive technology. Disability needs cautious study of the interaction between the human being; the specific assignment/purpose to be performing; the precise knowledge; and the exact background of communication. Actual risk at the present continue from the stream of the common function assistive technique dolls and equipments, creating it harder for expert to suggest the real device due to the very aggressive cost of the common function. Every child with particular requirements is a single unit with extremely comprehensive descriptors that differentiate him as of others. Only experts are capable to decide [6] [7].

III. METHODOLOGY

Sometimes the people who are not able to talk or they missing it in an accident, they found it very difficult to communicate their feelings or to suggest their points to other person. In this work the propose method is a Sign language Glove which can assist these people who are suffering from any category of speech fault to exchange a few words through the gestures with the assist of one hand sign language. The sender will make the gestures into alphabets senders and then it will convert gestures into visual type and audio form. The major of this project is to provide a system with efficient understandable Sign Language gesture for all text and speech [8] [9]. The analog to digital converter make utilize a glove based method including flex sensors. For every gesture made a indication is formed by the flex sensors equivalent to the hand sign and the microcontroller matches these gestures with the stored input data in the SD card. Then the device will translate alphabets into words by using specific gestures prepared by person.

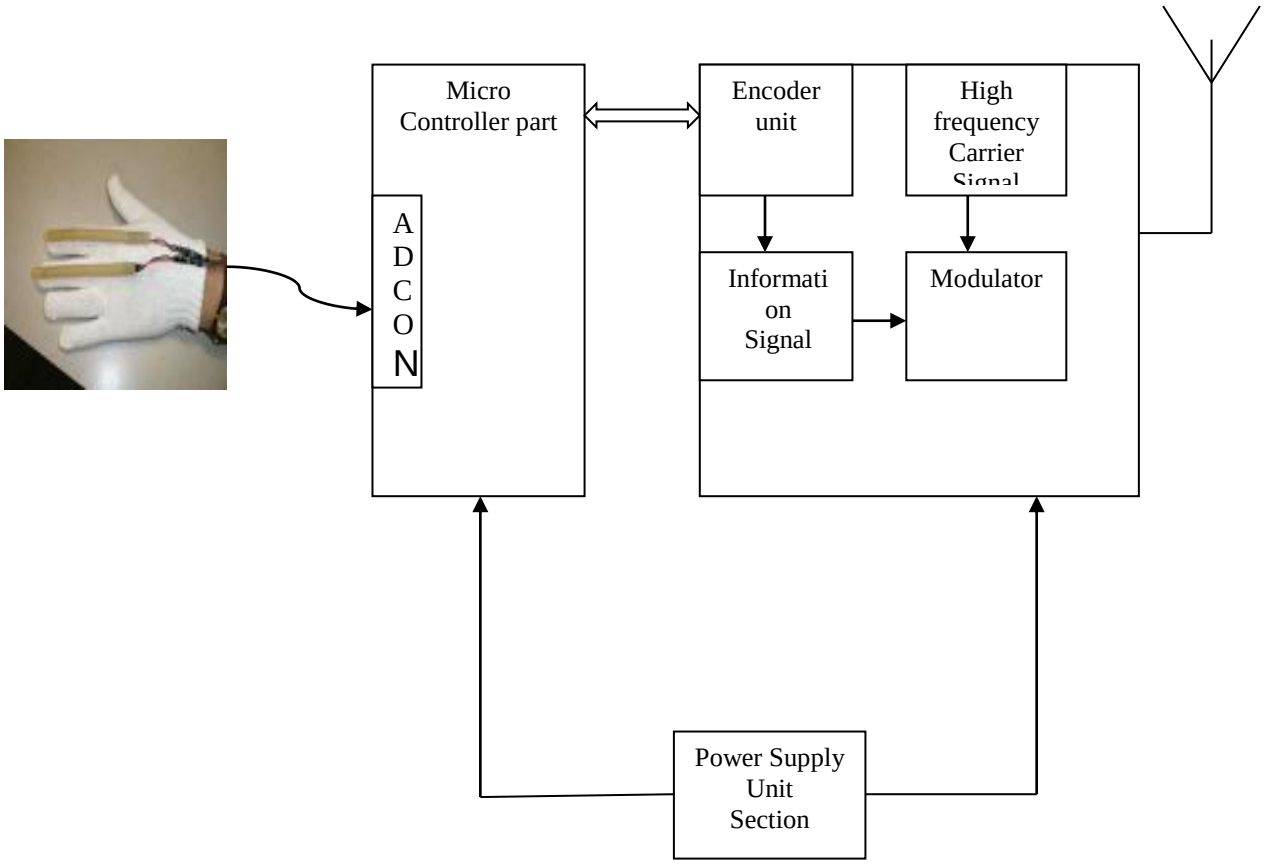

Figure1. Block Diagram Of Transmitting Block

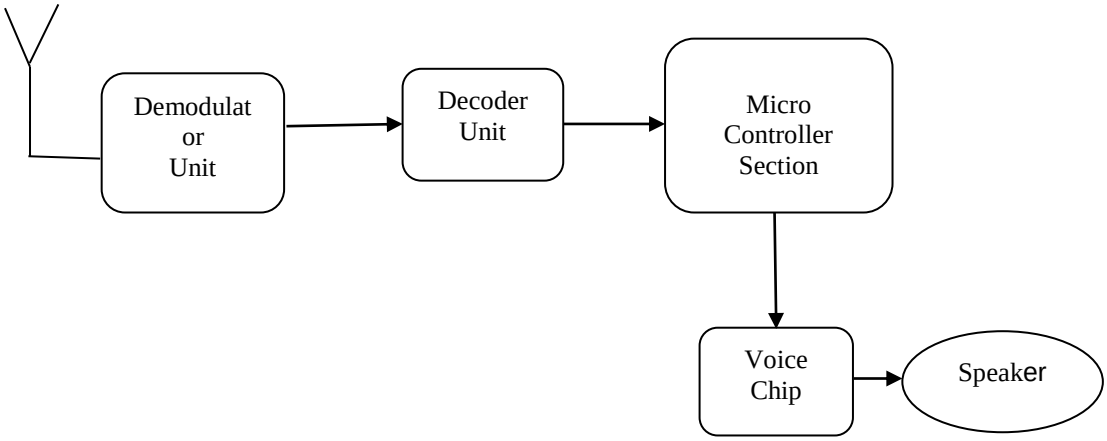

Figure 2. Block Diagram Of Receiver Block

This work uses PIC microcontroller to manage everyone in the process and flex sensors next to accelerometer sensors will follow the actions of the fingers as well as whole palm. The Liquid crystal Display will be used to show the user's gesture and a speaker to interpret the gesture into acoustic signal is designed if feasible for implementation [10] [11]. This work can be developed to know difficulties like food and water, Flex sensor signal given to the ADC. Analog to Digital converter converts corresponding analog signal into digital values to be encoded with encoder unit Which is then added with carrier signal and then information to be transferred through RF shown in figure 1.

In Receiver section, getting data to be decoded and then given to microcontroller through decoder . Microcontroller analyzes

these data and then give corresponding digital data to voice unit .Finally voice section gives (analog) voice to end user through Speaker shown in figure 2.In this work, we employ Radio Frequency Signal to broadcast the signal to Receivers.

IV. RESULT AND DISCUSSION

Recognition outputs are obtained on some stationary alphabets of the spanish sign language as shown in table 1. The various gestures has been indicated as many number of times, beneath the sign language commonly-predicted variable conditions. The authorized signing person did not have any response regarding the sign accepted by the system. The hardware kit for the proposed system is shown in figure 4.

The right sign recognition ratios are accounted. It is shown that the method works properly for the majority of letters, still reaching a 99% for a few of them. Most of the letters not reported corresponding to moving gesture, not deal with in the present work. In figure 3, F and T letters are not mentioned however their contours are moreover similar figures so the additional region based processing should be required. It should be renowned that response in the table matched to worst category and there is no output from the scheme to the signing person However, in a way that the signing person expected is to be on the computer screen, so that the user can become aware of the recognition output. It will change the hand pose on the fly, thus the sign is precisely recognized and recorded. The analysis we have carry out in this condition have revealed that a hundred percentage recognition ratio can be achieved without any difficulty.

TABLE 1 .Recognition Ratios

A- 99.2%	***G- 85.0%***	***M- 91.6%***	***R - 93.3%***
B - 99.7%	***H- 55.2%***	***N - 95.7%***	***S- 62.3%***
C - 96.2%	***I - 97.3%***	***O - 78.3%***	***U- 97.5%***
H - 95.7%	***K- 86.0%***	***P - 99.0%***	***W - 98.5%***
E- 99.2%	***L - 98.3%***	***Q - 92.6%***	

Figure 3. Letters ‘F’ and ‘T’ in LSE.

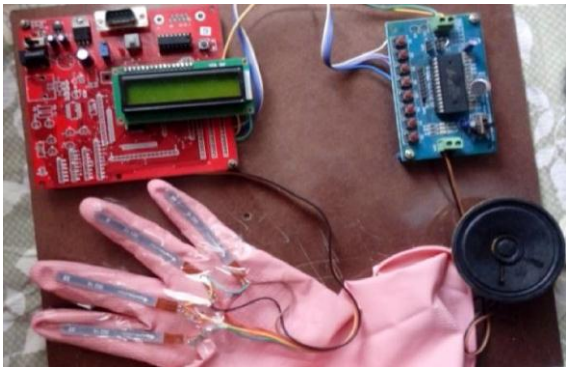

Figure 4. Hardware kit of hand talk

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