Giving Voice For Mute People

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Abstract-Generally dumb people use sign language for communication but they find difficulty in communicating with others who don't understand sign language. This project aims to lower this barrier in communication. It is based need of developing an electronic device that can translate sign language into speech in order to make communication easy in between mute and normal people. The data gloves is used which is normal cloth driving gloves fitted with flex sensors along the length of each figure and the thumb. Mute people can use the gloves to perform hand gestures and it will be converted into speech and also displayed on LCD in order to reduce the communication gap. A foremost goal of this paper is to provide readers with basis of understanding glove system technology used in biomedical science.

Keywords- Gesture recognisition, sign language.

I. INTRODUCTION

The development of most popular device of hand movement equiistion, glove based system started about thirty years ago and continues to engage a growing number of researches.

Communication is common language ,sign language is the language used by deaf and dump people. It is communication skill that uses gesture instead of sound to convey meaning simulteneously combining hand shapes. orientation and movements . A sign language usaully provides sign for whole words. It can also provide sign for letters to perform words that don't have corresponding sign in that sign language. In this sensor play the major role flex sensors are the sensors that change in resistance depending upon the amount of bend on sensors. The digital gloves lower this barrier in communication. It is an electronic device that can translate sign language into display or speech in order to make the communication take place between mute communities with general public possible.[1]

A deaf and dumb person uses sign language for communication involves the exchange of information, and this can only occur effectively if all participants use a common language. Sign language is the language used by deaf and mute people and It is a communication skill that uses gestures instead of sound to convey meaning simultaneously combining hand shapes, orientations and movement of the hands, arms or body and facial expressions to express fluidly a speaker 's thoughts. Signs are used to communicate words and sentences to audience. A gesture in a sign language is a particular movement of the hands with a specific shape made out of them. A sign language usually provides sign for whole words. It can also provide sign for letters to perform words that don't have corresponding sign in that sign language. In this device Flex Sensor plays the major role, Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. This digital glove aims to lower this barrier in communication. It is electronic device that can translate Sign language into speech in order to make the communication take place between the mute communities with the general public possible. It can also provide sign for letters to perform words that don't have corresponding Sign in that sign language. Sensor gloves technology has been used in a variety of application areas, which demands accurate tracking and interpretation of sign language. The paper explains the designing requirements, factors of digital gloves. This paper contains the map to develop a pair of gesture vocalize gloves. It gives the related works, explains the system architecture, characteristics and operation of each component in the system architecture provides the future works, advantages and disadvantages of this device.[2]

Finding an expert interpreter for day to day activities is a different task and is also unaffordable since communication is the fundamental aspect of human survival, various measures have been taken to technically improve the ease of communication for deaf and dumb people.

The paper contain map to develop a pair of gesture vocalize gloves it gives us related work, explain the system architecture provide future work advantage of this device.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

[1] Electronic Hand Glove Gesture to Voice Recognisation Using Physically Challenged Persons : V .Rajalakshmi , N.Vasudevan, Dr.Rajinigrinath, S.Praveen Kumar,Oct 2015

[2] Our group went to a school of deaf and dumb and also went to hospital to get more information about the project.

III. WRITE DOWN YOUR STUDIES AND FINDINGS

1. A Review paper on Hand Gesture Recognition and Voice Conversion System

By Sonal Garg, Shivani Singhal and Suman Kumari, October 2015

Generally dumb people use sign language for communication but they find difficulty in communicating with others who don't understand sign language. This project aims to lower this barrier in communication. It is based on the need of developing an electronic device that can translate sign language into speech in order to make the communication take place between the mute communities with the general public possible. A Wireless data gloves is used which is normal cloth driving gloves fitted with flex sensors along the length of each finger and the thumb. Mute people can use the gloves to perform hand gesture and it will be converted into speech so that normal people can understand their expression. Gesture detection mistreatment video and image process is employed for sanctioning the communication between the deaf, dumb and traditional folks. All the obtainable systems aren't moveable and not reasonable to poor folks. This paper introduce ,the history of communication technologies that have given higher access to the planet for those sensory disabilities that may be are high communication technologies that improve the communication method of deaf and dumb like persons and create them advanced to speak with the opposite traditional persons.

2. Automatic Generation of Speech (AGS) For Mute and Hearing Impaired People

By S. Arunodhayan, B. Prasanth, S. Sadham Hussain, S. Srivatsan, B.Sumathy, April 2015

The Automatic Speech generation System provides a suitable user friendly device to the mute and hearing impaired people in the world who are deprived of controlling things around them. This System can also be utilized for partially paralyzed people. Hence, A new form of handheld device is implemented to make people easy to use. This device utilizes the MEMS technology which produces signals corresponding to the movements made by the user. The microcontroller is preprogrammed with the signals corresponding to certain finger movements. When the finger movement made by the user matches with the saved movements, the microcontroller generates a certain code uniquely identifying the finger

movement and hence generates the audio output which has been pre-programmed to that particular finger movement. For the partially paralyzed people they can control the things such as fans, television, light etc on their own using relay to on or off the lights, fan etc by some particular hand movements so that they need not depend on the others for some basic needs and make them self-confident. Thus, this integrated system can surely provide a great substitute for physically challenged people. In the existing system there is no navigation system for physically challenged people. Our proposed system overcomes the technology which is not available in the existing system. In our proposed system the physically challenged and paralyzed people can control things around them without the help of others and make them do things lie normal human beings.

3. Translating Indian Sign Language to text and voice messages using flex sensors

By SachinBhat , Amruthesh M2 , Chidanand Das , May 2015

Communication plays an important role for human beings. Communication is treated as a life skill. Keeping these important words in mind we present our paper to mainly focused on aiding the speech impaired and paralyzed patients. Our work helps in improving the communication with the deaf and dumb using flex sensor technology. A brief description about various gestures and the implementation part is discussed in this paper. A device is developed that can translate different signs including Indian sign language to text as well as voice format. Flex sensors are placed on hand gloves for the use of above said people. Flex sensor" s resistance changes according to the flexion experienced. Sensors in the glove pick up gestures and transmit that to text data with the help of Analog to Digital convertor and microcontrollers. This converted text data will be sent wirelessly via Bluetooth to a cell phone which runs Text to Speech software and incoming message will be converted to voice. Here device recognises Indian sign language alphabets, numbers and symbols based on sensor movement. Keywords: Flex sensor, ADC, AT89S52 microcontroller, LCD, Bluetooth module.

IV. PROPOSED WORK

The block diagram of the project consists of four blocks –Five Flex sensor, ARM7, LCD, Bluetooth. Flex sensors are used to detect hand posture. Flex sensors are resistive carbon elements. When bent, the sensor produces a resistance output correlated to the bend radius.
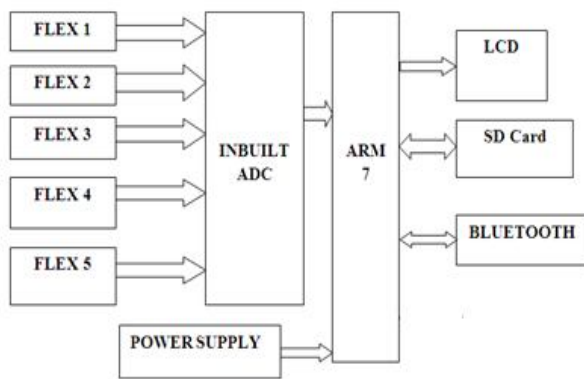
Fig Block Diagram

The variation in resistance is approximately 10 to 30 Kohm. An inflexed sensor has 10Kohm resistance and when bent the resistance increases to 30Kohm at 90 degree. The sensor is about ¼inch wide, 4-1/2 inches long. The five flex sensors are mounted on the fingers and thumb of the user. When user makes a hand gesture t o express a specific word the flex sensors gets folded. As the posture of each finger is different, so resistance value of each flex sensor is also different.

1. ARM 7 (LPC 2148):

The NXP (founded by Philips) LPC2148 is an ARM7TDMI-S based high-performance 32-bit RISC Microcontroller with Thumb extensions 512KB on-chip Flash ROM with In-System Programming (ISP) and In-Application Programming (IAP), 32KB RAM, Vectored Interrupt Controller, Two 10bit ADCs with 14 channels, USB 2.0 Full Speed Device Controller, Two UARTs, one with full modem interface. Two I2C serial interfaces, Two SPI serial interfaces Two32-bit timers, Watchdog Timer, PWM unit, Real Time Clock with optional battery backup,out detect circuit General purpose I/O pins. CPU clock up to 60 MHz, On-chip crystal oscillator and On-chip PLL. The block diagram of ARM 7 LPC 2148 is as shown below.

2. Flex Sensor:

Flex sensors are resistive carbon elements. When bent, the sensor produces a resistance output correlated to the bend radius. The variation in resistance is approximately 10 to 30 KOh ms. An inflexed sensor has 10Koh m resistance and when bent the resistance increases to 30Kohm at 90 degree. The sensor is about ¼ inch wide, 4-1/2 inches long.. The sensor is incorporated in device using a voltage divider network. Voltage divider is used to determine the output voltage across two resistances connected in series i.e. basically

resistance to voltage converter. The resistor and flex forms a voltage divider which divides the input voltage by a ratio determined by the variable and fixed resistors.
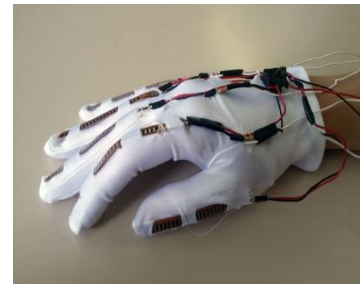

Fig.Flex sensors with glove[1]

V. RESULT

We have implemented five sentences they are as:

*   00000: PLEASE HELP ME.
*   00010: PLEASE GIVE WATER.
*   00011: THANK YOU.
*   00101: HOW ARE YOU.
*   10110: I AM FINE.

In this prototype version, the user forms a sign and holds it for two seconds to ensure recognition. The system is capable of recognizing signs more quickly than this arbitrary two seconds limit .Hence it is a low time consuming approach Further more real time recognition ratio of nearly 98.99% can be easily achieved.

VI. ADVANTAGES

Sign language recognition systems are used to convert sign language into text or speech to enable communication with people who do not know these gestures. It difficult for a novice to determine whether and how well a particular glove suits a particular application. Athrough study of the literature, especially of the one describing how gloves were applied for different uses, can then help this matching process, at the same time highlighting practical issues that may arise during it.

*   It requires fewer components so cost is low.

- Small in size. Due to small size we can place its hardware on our hand easily.
- Light weight.
- Flexible to users.
- It takes less power to operate system.
- Easy to operate : anyone can operate it easily.
- Easy to define gesture, we can add or define our own gestures.
- Communication is possible in any language.

VII. APPLICATION

- Physically challenged persons.
- Communication between the mute peoples and mute peoples.
- Medical applications.
- In public place for announcement.
- Conveying information related operation

VIII. CONCLUSIONS

Sign language is useful tool to ease the communication between deaf & normal people. Deaf people have difficulty in communicating with others who do not understand sign language. Even those who do speak aloud typically have a "deaf voice" of which they are self-conscious and that can make them reticent. The Hand Talk glove is a normal, cloth driving glove fitted with flex sensors. In this project aims to lower the communication gap between the deaf or mute community and the normal world. A prototype to check the feasibility of recognizing sign language using sensor gloves. With this project the deaf or mute people can use the gloves to perform sign language and it will be converted in to speech so that normal people can easily understand. The main feature of this project is that the gesture recognizer is a standalone system, which is applicable in daily life.

ACKNOWLEDGEMENT

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