Design a Hand Gesture Recognition and Voice Conversion System for Mute People

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Abstract— Communication is the most important part of life. In this paper we propose a model that recognize American Sign Language (ASL) and convert signs to voice using hand gesture recognition system. This model will surely be implemented in real life to make the life of mute people easier. We are designing a Flex sensors based wireless data gloves for the recognition of ASL. 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 [4]. 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.

Key words: Voice Conversion System, Mute People

I. INTRODUCTION

There are different languages in the world which are used for communication such as American Sign Language (ASL) [1] [2], British Sign Language (BSL) etc.

ASL is the language used by 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 project Flex Sensors Plays the major role, Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor[5]. We are in process of developing a prototype using this process to reduce the communication gap between differentially able and normal people.

II. PROPOSED MODEL

In this project have two parts one is transmission section or wireless data gloves and other one is receiver section.

A. Transmission Section

In transmission section have one normal cloth driving gloves fitted with Flex sensors, arduino and Bluetooth module.
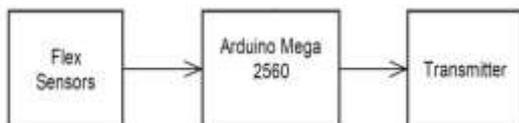

Fig. 1: Block diagram of the transmission section

B. Receiver Section

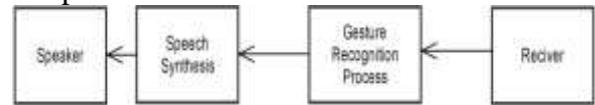In receiver section have Bluetooth receiver and laptop with speaker.

Fig. 2: Block diagram of the receiver section

III. METHODOLOGY

Fig.1 shows the block diagram of hand gesture recognition for mute people using ASL. In the above fig 1 flex sensors which are variable resistance sensor which are placed on each of the fingers of the dumb people. This sensor is used to determine the position/angle of the fingers [3]. Microcontroller processes the data for each particular gesture made. Microcontroller is used to read data from different sensors and then transmit these data to the other system via Bluetooth module Laptop is used as gesture recognition section which compares the predefined data with received data. If compared data get the matched then matched gesture sent with text to speech conversion module.
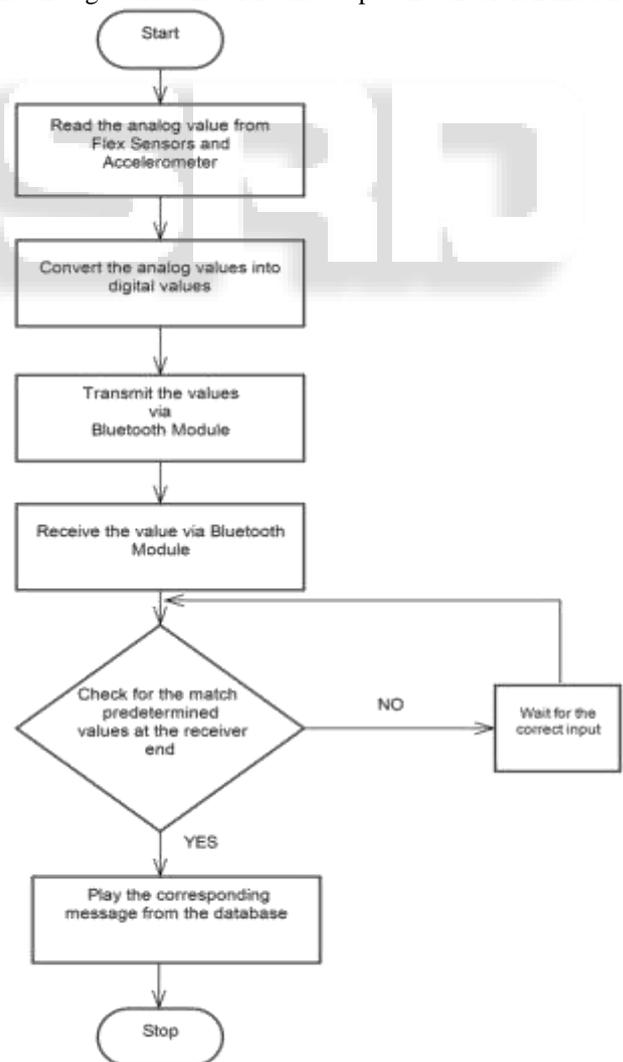

Fig. 3: Flow Chart

IV. APPLICATIONS

This system will almost bridge the communication gap present between the mute community and the normal world. It can be used at public places like stock market, airports, railway stations and counters of banks, hotels etc. where communication is essential. This device may come helpful even in a fire extinguishing process. A mute person can also deliver a lecture using it. This device can be used in a variety of applications like computer gaming. A normal person can easily learn the sign language using this device. The system also has several advantages like low cost, compact, handy and portable, flexible to users, less power consumption etc.

V. CONCLUSION

Sign language is a tool used to communicate between the mute community and the normal people. But it is difficult for the mute community to communicate with people who do not understand the sign language. This system prototype was designed to automatically recognize sign language to help normal people to communicate more effectively with speech impaired people. This system recognizes the hand signs using sensor gloves and these recognized hand gestures are converted into speech so that normal people can easily understand. The project aims to lower the communication gap between normal world and the mute community.

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