AN APPROACH TO IMPROVE DEAF AND DUMB PEOPLE COMMUNICATION THROUGH THE ANDROID APPLICATION WITH EMBEDDED SYSTEM

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Abstract:

The advancement of Technology has impacted all aspects of the human life. Sign Language is the primary means of communication in the deaf and dumb community. Dumb people are specially trained to use this sign language. But normal people are not able to understand what the dumb and deaf people are trying to say. The problem arises when dumb or deaf people try to express themselves to other people with the help of these sign language grammars and vice a versa. This paper presents a language converter for deaf and dumb people. In the present world it is very difficult for the deaf & dumb people to talk with the ordinary people. So it becomes impossible for them to communicate with the ordinary people unless and until ordinary people like us learn the sign language for the purpose of communication. The sign language of deaf and dumb is quite difficult to learn and it is not possible for everybody to learn that language. So every person cannot come and share their thoughts with these physically impaired people. So here is a system which would enable the deaf and dumb to communicate with each and every one. The application provides deaf people a way of getting more closed to advanced technology by using speech to image translation. The implementation of project is Choose language: it displays the languages which the user needs to select such as Tamil, English, and Telugu. After choosing the language, have to click the translate button. It translates the particular actins into voice. Play as audio button has to play the audio which has been translated. If the user needs to see the audio as text the view as text message provides these options. The work presented in this paper mainly reduces the communication gap between dumb and ordinary people and aims to facilitate dumb person's lifestyle.

Keywords: Embedded system, Flex sensors, AVR microcontroller, ASL (American Sign Language), Android application.

1. INTRODUCTION

As the name suggests, this system"An Approach to Improve Deaf and Dumb People Communication through the Android Application with embedded system". Dumb/ mute people use sign language for communication purpose. Sign language uses gestures instead of sound to convey information. This language includes combining hand shapes, hand movements, facial expressions to express individual's thoughts. In this system flex sensors plays the major role. Flex sensors are attached to the glove using needle and thread. Flex sensors are the sensors whose resistivity varies with the amount of bend. In this paper, AVR microcontroller is used to take input from flex sensors and then this analogue data is converted to digital form by using micro controller. All the data from microcontroller is sent to android phone and accordingly the android phone will speak the corresponding character which has been sensed.

2. IMPORTANT PARAMETERS

A. Flex sensors

Flex sensors are attached to the gloves of the dumb and mute people. Through these gloves gestures has to be performed. Flex sensors changes their resistance as per the degree of bend. When there is no any bend, its resistance is 10kΩ. Flex sensors consist of number of conducting particles. When there is a bend, conducting particles in the flex sensors get separated. Due to this, current decreases and resistance increases. Therefore, flex sensors are also known as bend sensors.

Fig.1.

B. American Sign Language

Gestures are specifically performing action or hand movements to convey meaningful information. ASL is a standard sign language which is used in US and Canada. In this research American Sign Language is used. To learn this language dumb/ deaf people need to undergo special training. ASL is transmitted from generation to generation primarily through residential schools and dumb and deaf adults.
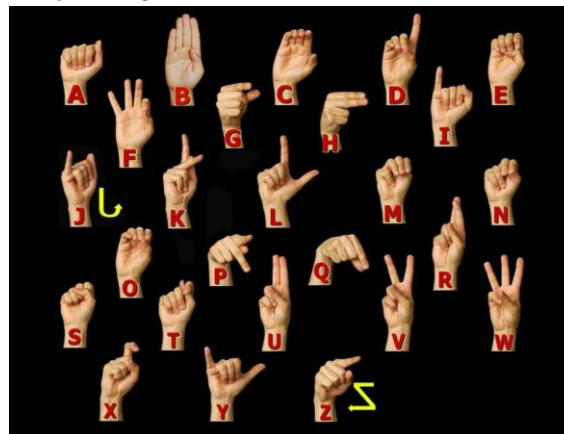

Fig.2.

The most effective way to communicate with dumb/ deaf people is to use sign language. The simplest system includes understanding of finger spellings. These are shown below. According to these finger spellings database has been created for each alphabet [2-4].

C. *Proposed system*

The proposed model will be consisting of combination of hardware and software. Hardware part will include flex sensors on each finger, microcontroller, power supply, and android phone and Bluetooth module. Software part will include programming for android phone application. Hardware part will be consisting of flex sensors to take input from different gestures through gloves, microcontroller to convert input analogue data to digital data and for further processing, power supply to provide voltages to specific units, and finally Bluetooth module to send the data from controller to android mobile. Here HC-05 Bluetooth module will be used. The proposed system is shown below:

3.   PROPOSED SYSTEM

A. *System Overview*

The proposed system is divided into the following sections

Fig.3.

B. *Block Diagram*

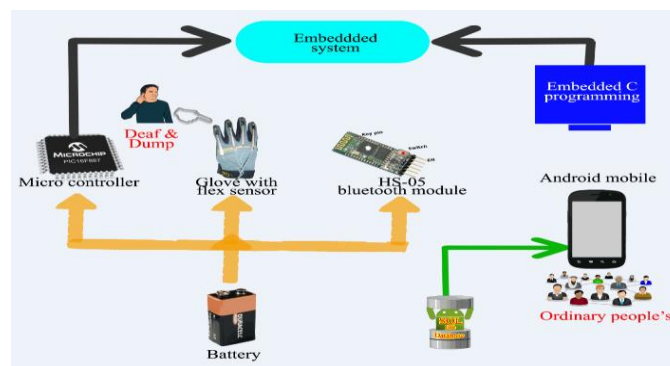The Block Diagram of the system is given below

Fig.4.

C.   *Working Principle*

The working principle of the various major blocks or sections used in the proposed system is given below.

Flex sensors

Flex sensors are attached to data glove by using needle and thread. Resistivity of flex sensors changes as per the degree of bend. So, as the dumb people perform different gestures we will get different value of

resistance for different gestures. And according to that database is created. This analogue data from flex sensors is given to microcontroller for further processing. Flex sensors are attached to port A of the controller as port A pins are ADC pins. So the analogue data is converted to digital form.

Power Supply

An AVR microcontroller and flex sensor needs 5V DC voltage whereas operating voltage of Bluetooth module is 3.3V. Power supply consists of transformer, rectifier, filter and regulator. The rectifier used here is a Bridge Rectifier which converts 230V AC into desired DC voltage.

Microcontroller

This is the heart of the complete system. Here AVR ATmega 8535 microcontroller is used. It has in built ADC. The analogue input data from flex sensors is converted to digital form by micro controller. Then the input data has been sent to android phone by Bluetooth module. For programming, embedded C is used.

Bluetooth Module

The microcontroller sends the digital data to android phone by using Bluetooth module. In the proposed system, HC-05 Bluetooth module is used. It makes good serial communication with AVR microcontroller.

Android Mobile

The digital data from controller is given to android mobile by using Bluetooth module. The database is created for different alphabets of American Sign Language in the android phone. When the input data matches with the data in the database then we will get the required output i.e. speech as well as text. To create android application java coding is used.
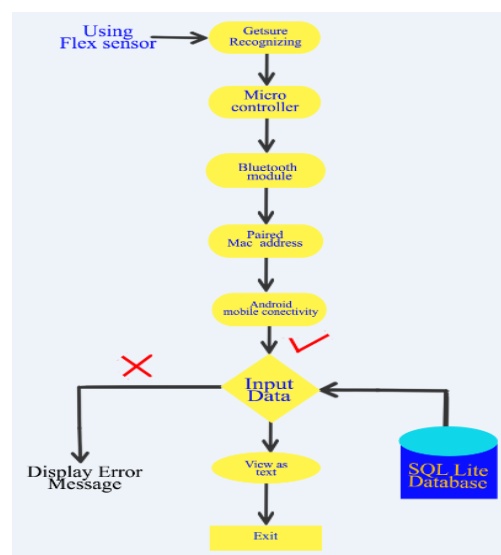
D. Dataflow Diagram

Fig.5.

D. Technology & Programming Languages

The technology used here is embedded technology which is the future of today's modern electronics. The proposed work includes combination of hardware and software. The followings are the various Programming Languages & technologies used in the proposed system.

For Embedded System

- Embedded Technology
- AVR Based Controller
- Embedded C programming
- Proteus Software for PCB Designing
- Dip Trace for PCB layout

For Android mobile

- SQL server based database
- java coding-Eclipse software
- Android application

E. Steps for project development

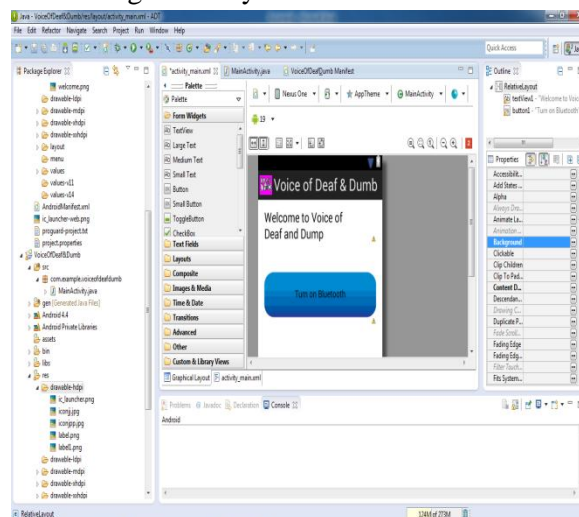The following are the steps for creating such a system:

Fig.6.

- Defining the Problem
- Understanding the Need & Usability in real life
- Developing Block Diagram
- Designing Circuits of individual blocks
- Testing circuits in LAB & Finalizing

• Developing PCB on PC and getting it printed

• Soldering the components

• Testing and troubleshooting

• Developing Flowchart for the entire process

• Writing, Compilation & Burning actual
  Software Program, as well as testing and debugging

• Developing Flowchart for Android Side
  Software and   developing Data Flow Diagram

• Writing actual code and finally Running the system

OUTPUT

Our project to Implement Choose language: it displays the languages which the user needs to select such as Tamil, English, and Telugu. After choosing the language, have to click the translate button. It translates the particular actins into voice. Play as audio button has to play the audio which has been translated. If the user needs to see the audio as text the view as text message provides these options.

Fig.7.

CONCLUSION

• The project aims to reduce the communication gap between deaf or mute community and normal people.

- This system will improve dumb/ deaf person's lifestyle. Even it will be beneficial for the communication between the blind person and the dumb person.

FUTURE ENHANCEMENTS

The system can be extended to support more number of signs, and different languages mode

- Different software development strategies and various programming techniques can be exploited to enhance system's efficiency.

- We are implement all type sign languages in this project paper based on the implement motion sensors.

- And implement all Type of languages with comfortable for deaf and dumb peoples.

REFERENCES

[1]Sumathi M S, Ashwin B M, Balaji V, Sharath M Kumar, " Give Voice to the Voiceless Using Microcontroller and Digital Gloves", International Journal of Scientific & Engineering Research, Vol. 5, Issue 5,May-2014 , ISSN 2229-5518 .

[2]M. Mohandes, M. Deriche, and J. Liu,"Image-Based and Sensor-Based Approaches to Arabic Sign Language recognition", IEEE Transactions on Human machine and computer systems, Vol. 44, No.4, August 2014.
[3]Gunasekaran K, Manikandan R. , "Sign Language to Speech Translation System Using PIC Microcontroller", International journal of engineering and technology, Vol.5, No. 2, Apr-May 2013.

[4] Sakshi Goyal, Ishita Sharma, Shanu Sharma' "Sign language Recognition System for Deaf and Dumb People" International Journal of Engineering Research & Technology, vol. 2, issue 4, April 2013
 [5] Praveenkumar S Havalagi, Shruthi Urf Nivedita, "The Amazing Digital Gloves that gives voice to the voiceless,", International Journal of Advances in Engineering and Technology, Vol.6, Issue 1, pp 471-480, March 2013.

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